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THE TREATMENT OF ACUTE SUPPURATIVE ARTHRITIS OF THE KNEE JOINT.[1]

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I HAVE a very real appreciation of the high compliment you have paid me in asking me to address you this evening and I ask you to accept my sincere thanks for it. I can only hope that those of you who represent the Orthopædic Section, may find something of interest in my paper. It will deal only with the treatment of acute arthritis of the knee joint and will make but passing reference to those sequelæ—partial or complete ankylosis—which perhaps concern you more intimately.

The subject under discussion is one of great perplexity and one which has, I think, received less than its due attention in the textbooks, where, as a rule, the treatment is disposed of in a few brief paragraphs. There is no surgeon, however wide his experience, who approaches such a condition without considerable misgivings, and yet if he turns to accepted authorities for help, it is to find there little more than some rather vague generalities and a gloomy prognosis. It is especially true of this condition, one finds, that "judgement is difficult and experience fallacious" and this is so for two reasons.

In the first place the outcome, even under the most skilful treatment, is largely determined by the two factors of the virulence of the infection and the resistance of the patient, neither of which can be immediately assessed except in the most general way. And the second is that few surgeons in normal times are called upon to treat very many patients with suppurative arthritis of the knee, and those only at such considerable intervals that the value of earlier experience is apt to have been lost. I do not think that I have had more than half a dozen patients with suppurative arthritis of the knee joint under my care since the war and in their treatment I have continued to apply the principles which seemed to me at that time to underlie the treatment of this condition.

An infective arthritis may occur as part of a general systemic infection or pyæmia, as a local

[1] Read at a meeting of the Section of Surgery of the New South Wales Branch of the British Medical Association on October 20, 1926.

extension of an osteomyelitis or acute bursitis or as a direct result of a wound (accidental or operative) involving the joint. This last is probably the most usual cause and is the one which for present purposes it is best to accept. For the problem in certain cases of mild pyæmia is often much less difficult and, on the other hand, when a local osteomyelitis is present as the primary cause, it is a much more serious one. In neither of these two conditions can the arthritis be considered typical.

May I be allowed to digress for a moment here to remark a not uncommon diagnostic error—that of confusing infection around the knee joint with infection within it. The condition is usually a suppuration in the prepatellar bursa, which through delay in incision has led to a rather widespread cellulitis of the region of the knee. It is quite unnecessary to discuss the differential diagnosis here, nor does it ever present any great difficulty, but on several occasions I have been asked to see such a condition as an acute arthritis.

To what special circumstances is the seriousness of suppuration in the knee joint due? To such a question I would answer that there are two main causes and a third of considerably less importance.

First there is the well known complexity of the joint cavity itself with its recesses and diverticula and the consequent difficulty in securing drainage.

Secondly there is the anatomy of the popliteal space, containing as it does much fat in which are concealed several vessels and nerves of great importance. This space is roofed over by a fascia stretching across between the taut lateral boundaries, the hamstring muscles. As a result it is not always easy to determine the presence of abnormal fullness in this region and thus a collection of pus may burrow widely before any certainty is felt as to its existence. Moreover, the timid operator is apt to shun incision into the space until he can be sure of finding pus at no great depth. Still more is he unwilling to anticipate pus formation in the space by timely incisions in the posterior capsule. If the anatomy of the popliteal space were such that access to the posterior aspect of the knee joint were simple, suppuration there would lose much of its ill-repute.

A further cause, but one of much less importance, is the great vascularity of the whole region of the knee joint; as a result of this toxæmia may be unusually severe, particularly when pus forms outside the capsule.

Except for this last special feature suppuration in the knee joint is quite akin to suppuration elsewhere in the body, in that both toxic effects and likelihood of further spread are in direct proportion to the tension under which the pus is present. If tension be reduced to zero by thoroughly effective drainage, toxæmia will steadily diminish and extension to parts around the joint will be unlikely to occur. To secure such a reduction nothing short of dependent drainage can be regarded as reliable. The problem before us then is that of applying this principle to all parts of a complicated joint cavity and of insuring that pocketing does not occur at any later stage. Under such conditions (provided that the infection be not too virulent or the resistance of the patient unduly low) recovery should follow.

Reference has been made earlier and will be made again, to these last two factors as being variables difficult of assessment. We have all seen patients with arthritis of the knee recover following drainage of the most imperfect description. Here virulence must be very low and resistance high; but the memory of such a case should not be allowed to blind us to the general necessity for effective, that is to say dependent, drainage.

At this point it may be well to give a little consideration to the surgical anatomy of the knee. I would recall to your minds the way in which the joint cavity is roughly divided into anterior and posterior compartments by the projection into it of the synovial covered infrapatellar pad of fat with its prolongations the *ligamentum mucosum* and the *ligamenta alaria* (see Figure I.). The posterior compartment again is divisible into right and left halves by the crucial ligaments which with their covering of synovial membrane form a definite longitudinal ridge or watershed projecting forwards into the joint between the femur and the tibia (see Figure II.). These three structures, the two crucial ligaments and the infrapatellar fat pad, indicate the original tripartite nature of the joint with its two tibio-femoral and its patello-femoral articulations.

In connexion with each of these three divisions there is as a rule a diverticulum or recess of synovial membrane. Thus above the patella is the subcrureus bursa; postero-internally is the bursa between the internal condyle, the inner head of the gastrocnemius and the semi-membranosus muscles and postero-externally there is the prolongation along the tendon of the popliteus muscle.

These synovial recesses constitute weak spots in the joint wall, for the true capsule is absent there and if joint tension be raised by collection of pus the wall is likely to yield at these points and the pus to track in various directions—into popliteal space, thigh or calf. Moreover and this is of the greatest importance, the two posterior diverticula constitute the most dependent parts of the joint cavity with the leg in the usual horizontal position.

Now it is significant that spread on the anterior aspect of the femur is seldom or never seen, because free and dependent drainage of the whole anterior compartment is so readily secured by simple parapatellar incision. On the other hand, as was pointed out by Fullerton,[1] the pouch along the popliteus which is drained with difficulty, is rarely found to have escaped in limbs which come to amputation. The common route by which pus tracks into the calf, is of course *viâ* this pouch, just as the bursa under the outer head of the gastrocnemius forms the common route to the posterior part of the thigh.

Enough has been said, I think, to show the necessity, in most cases at all events, for securing free and unimpeded drainage of each of the three joint compartments, particularly the two posterior areas

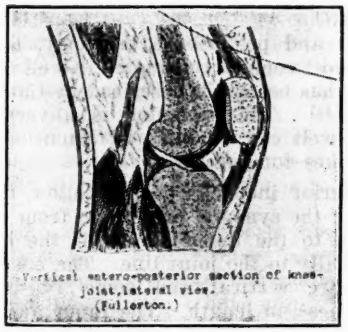

FIGURE I.
Vertical Antero-Posterior Section of Knee Joint Showing Synovial Cavity and Projection into it of Infrapatellar Pad of Fat. (After Fullerton.)

and it remains to examine the various methods that have been suggested to see to what extent they fulfil this requirement.

Methods of Drainage of the Knee Joint.

The following methods of draining the knee joint will be considered, passing from the most conservative to the most radical.

1. Repeated aspirations, that is, intermittent drainage with or without lavage or the injection of some antiseptic such as 2% formalin-glycerin.
2. Jaboulay's arthrotomy—an incision into the suprapatellar bursa with elevation of the whole leg.
3. Anterior arthrotomy by parapatellar incisions.
4. Anterior and posterior arthrotomy incisions.
5. Antero-lateral arthrotomy, with division of lateral ligaments, removal of the menisci and division of the tendon of the popliteus muscle.
6. Transverse arthrotomy.
7. Excision of the knee joint.
8. Willems's method of arthrotomy followed by active mobilization.

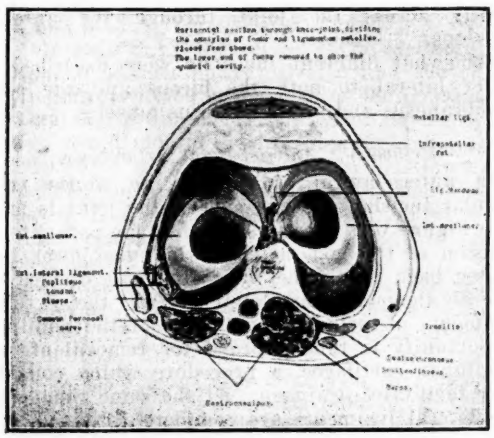

FIGURE II.
Horizontal Section through Knee Joint, Dividing the Condyles of the Femur and the *Ligamentum Patellæ*, viewed from above.

FIGURE III.
Showing Knee Joint Injected with Bismuth, Lateral View. Note extension along the popliteus tendon. (After Fullerton.)

Method I.: Repeated Aspiration.

All that can be claimed for repeated aspiration is that from time to time the tension is lowered in the anterior compartment and to a lesser extent in the posterior compartment. Under such treatment a few joints may doubtless recover; I have had personal experience of two such. The infection in these cases was very mild (in one a *Staphylococcus aureus* and a Gram-negative bacillus and in the other a streptococcus) and I question if the antiseptic injection contributed in any way to the result.

Probably only a very occasional case will respond to such treatment throughout and very great watchfulness is necessary lest harm result from persisting over long with it.

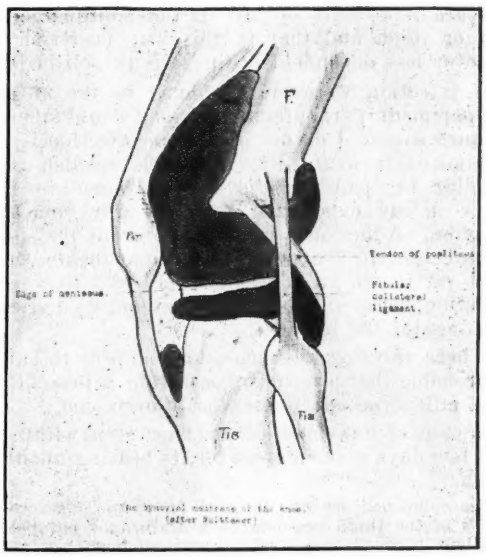

FIGURE IV.
Showing the Synovial Membrane of the Knee. (After Whittaker.)

Method II.: Jaboulay's Arthrotomy.

Jaboulay's arthrotomy is mentioned simply because it represents a recognition of the necessity for dependent drainage which is sought by incision of the suprapatellar pouch and slinging the leg. Even when slung vertically, however, the postcondylar recesses must remain undrained except by overflow (see Figures III. and IV.) and problems of immobilization combine with its inherent defects to defeat the method.

Mayo Robson,[2] recognizing the underlying necessities, suggested as an alternative the prone position with the foot of the bed well raised, but brought forward no record of cases so treated. Kellog Speed[3] records six cases treated by subcrureus drainage and inversion for two hours night and morning. The periods of inversion were lengthened in the later stages. The results were classified as: four good, one questionable or unknown and one amputation. He states that "patients need encouragement and even anodynes," but suggests the use of the method "in the first stage of knee joint infections, even for those which threaten to become acute."

Method III.: Parapatellar Incisions.

Parapatellar incisions can obviously drain the anterior compartment alone, allowing at the same time an overflow from the posterior pouches. Nevertheless such is probably the most usual type of operation performed in the earlier stages of a suppurating knee joint and much stress is laid upon the necessity for opening the cavity well out at the limits of reflexion of the synovial membrane.

To the argument that some joints do recover under simple parapatellar incisions alone it may be replied that such recoveries commonly follow long and serious illnesses in which secondary collections of pus are repeatedly opened in the popliteal space, calf or thigh and that in this way posterior and more or less dependent drainage is established.

If infection were ever confined to the anterior compartment, parapatellar incisions would suffice in all such cases. I do not believe an infection is ever so limited in acute arthritis. The swollen infrapatellar fat pad and *ligamentum mucosum* have never in my experience exercised any "omental" function. Adhesions are said to prevent the spread of infection to the posterior compartments, but I have yet to see an adhesion, competent to wall off infection, between these structures and the articular cartilage of the femur.

Where anterior drainage alone suffices to cure it is probable that a posterior infection is present, but is of mild type and is eventually overcome.

A case of ankylosis of the knee seen within the last few days is of interest for its bearing upon this belief.

The joint had become infected following a severe cellulitis of the thigh and had been drained by parapatellar incisions through which drainage tubes had been passed. The anterior compartment, well drained, had quickly recovered, leaving the patella mobile. The posterior compartments, imperfectly drained, had recovered in time, but the price had been paid in a complete ankylosis.

Method IV.: Anterior and Posterior Arthrotomy.

Anterior and posterior arthrotomy, the method probably most commonly adopted in well established infections, has been well described by Campbell and Wolfenden.[4] The operation is a very valuable one when well carried out and attention to small details makes for success.

The anterior incisions should follow the line of reflexion of the synovial membrane from the femur, proximally to the upper limits of the subcrureus bursa, distally to the joint line. The posterior skin incisions are vertical and some 7·5 centimetres (three inches) in length. The inner and outer incisions are placed just internal to the semitendinosus and biceps tendons respectively, care being taken of the external popliteal nerve (see Figure II.). Retraction of these edges and of the hamstring tendons and the nerve with careful deepening will allow incisions to be made through the posterior capsule, cutting on to an instrument passed through the joint from in front. These incisions into the capsule should be transverse and free, dividing portions of each head of the gastrocnemius. The outer transverse incision will probably divide the popliteus tendon also.

Practice varies regarding the use of drainage tubes—whether employed at all, passed down to the incisions in the capsule only or across the joint in various directions. Both Ollier and Campbell and Wolfenden pass tubes antero-posteriorly from one incision through the joint cavity to the other, under cover of the lateral ligaments. Ollier employs plain tubes, Campbell the smaller perforated Carrel tubes.

My own feeling is that the antero-posterior passage of tubes is better dispensed with and while I believe that the use of the Carrel-Dakin irrigation is of great value, I think that the tubes should not be placed where space is obviously so limited and pressure changes in cartilage are likely to occur.

I prefer to suture folded rubber dam in place in the posterior incisions, passing Carrel tubes transversely across the joint through the anterior incisions.

Somewhat different incisions were described by Ollier lateral to both the biceps and the semimembranosus and semitendinosus muscles.

Method V.: Antero-Lateral Arthrotomy.

In antero-lateral arthrotomy an almost rectangular incision on each side of the joint is made (see Figure V.). The upper limb is the parapatellar incision of the last method, while the lower limb passes back along the joint line and divides the lateral ligament completely. With the external ligaments is included the tendon of the popliteus. Opportunity is thus afforded for removal of both semilunar cartilages, a procedure which considerably facilitates drainage. At the same time, when the lateral ligaments are completely divided, it is possible to pass Carrel or other tubes horizontally inwards at the lower ends of the incisions into the postcondylar recesses. Free drainage of these recesses largely diminishes the chance of spread into

the popliteal space *viâ* the communicating bursæ. Other tubes are passed across the joint above and below the patella. This method appears to be unnecessarily severe and mutilating, but in reality it is not so, for, in the type of case to which it is properly applicable, ankylosis is practically certain to follow and thus neither the removal of the semilunars nor the division of ligaments is in any way detrimental.

Moreover, the menisci, being poorly vascularized, are always liable to necrose in severe infections and their removal thus early may materially shorten the period of suppuration. I have seen a cartilage extruded whole some time after lateral incision had been made without removal of the cartilage.

Method VI.: Transverse Arthrotomy.

Parapatellar incisions with laying open of the joint cavity by transverse incision at the level of the joint line followed by flexion of the joint is spoken

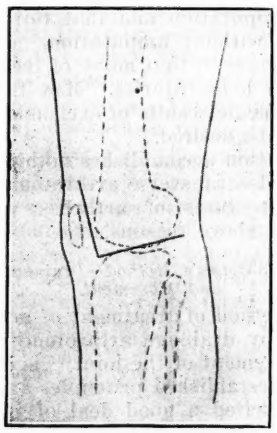

FIGURE V.
Showing Incision for Antero-Lateral Arthrotomy.

of, for the sake of brevity, as transverse arthrotomy (see Figure VI.).

By this radical procedure the infrapatellar and both lateral ligaments are divided and the only remaining ligamentous connexions of the bones are the crucial ligaments and the posterior ligament of Winslow. On flexion of the knee to a right angle or rather less and on turning back the patellar flap and excising the fat pad and menisci, the whole joint cavity is freely exposed to view and so laid open that pocketing or burrowing of pus is very unlikely to occur.

As the operation is perhaps less commonly practised than most, I will describe it in some detail.

With the knee flexed, a transverse skin incision is made, starting on the inner side about two centimetres above the joint line from just in front of the sartorius tendon to a similar point in front of the tendon of the biceps. The joint is opened by dividing all the ligaments right across to a similar extent. The internal saphenous vein is spared, if seen. If parapatellar incisions have not been made earlier in the history of the case, these are made

FIGURE VI.
Showing Knee Joint Opened by Transverse Arthrotomy.

now, the lateral synovial reflexions being opened as far back as possible. With the knee in full flexion as for an excision the pad of fat and *ligamentum mucosum* are excised and then both the menisci are removed with scissors and scalpel. If the lateral ligaments have been sufficiently divided and an assistant suitably manipulates the leg, abducting and adducting it as required, this is not difficult. The tendon of the popliteus will be divided at this stage if it has escaped earlier.

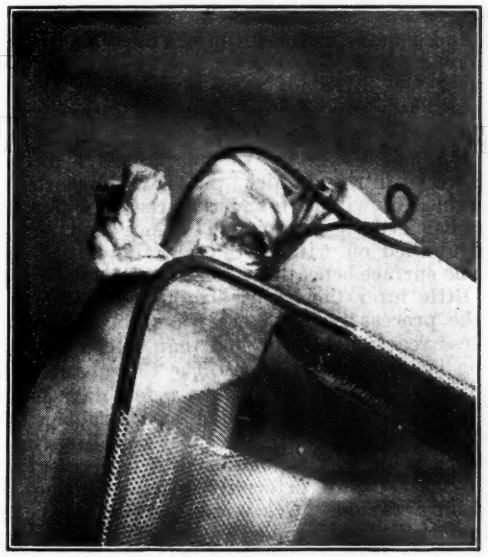

FIGURE VII.
Showing Knee Joint Opened by Transverse Arthrotomy with Carrel-Dakin Tubes in Position.

The bursal prolongation around the tendon is investigated as regards the presence of pus and any communication of the joint with the bursæ under the heads of the gastrocnemius is noted.

It will now be found that with the joint in flexion to about 80° a finger can be passed freely from each end of the incision into the pouches behind the femoral condyles as far as the mass of the crucial ligaments in the intercondylar notch. The tourniquet is now removed, very careful hæmostasis secured and the joint thoroughly irrigated. Carrel's tubes are laid across the exposed joint surfaces and carefully adjusted behind the condyles (see Figure VII.) and dressings applied. I formerly used the Jones "crab" splint, bent to an angle of 75° and plentifully padded, especially behind the knee. For several reasons I now prefer a Thomas knee splint, similarly bent. With this splint light extension can be applied by means of a foot piece. The limb is supported by two pieces of perforated zinc, while the dressing is kept in place (and the popliteal space supported) by a flannel sling. If the infection has been very acute the patellar flap is allowed to remain turned up on the front of the thigh; if less acute, it may be allowed to drop back over two or more Carrel tubes. In the ward the splint is slung so that the lower leg is horizontal and the instillations of Dakin's solution are begun.

If the pulse and temperature are satisfactory and no oozing occurs, dressing may be deferred for two or three days. An anæsthetic is then given, as in the earlier stages dressings are both tedious and painful without one. I believe that the less frequently the dressing is done, the better, due regard being paid to the pulse and temperature, amount of discharge, comfort or otherwise of the patient and the general condition of the joint as revealed at the last dressing. However much care is exercised, dressing always entails some laceration of granulations and general movement of the parts and this is often reflected in the temperature chart. Between the first few dressings three days is an average interval; later this may be increased to five or six with advantage.

At the end of a period varying from ten days to three weeks during which the flexed position is maintained, it will be found that the articular cartilage has become darker in colour and can be readily pulled off with forceps, leaving a granular red bone surface beneath. Either at the same sitting or a little later the leg is straightened somewhat and the process repeated every few days. In this way less reaction is provoked than if complete extension is produced at once. The Carrel tubes are retained behind the condyles for a few days longer and when they are removed a small rubber dam drain replaces them until the space is obliterated.

The leg being now straightened, it is necessary to guard against any deformity arising during the ankylosing period. *Genu recurvatum* may come about from lack of support to the popliteal region, in-knee from the pull of the adductors and a rotation of the tibia upon the femur if a vertical foot-piece has been employed.

It will be found that the patellar flap has by this time retracted considerably. To cover the granulating surface as far as possible the patella is now excised, a step which considerably mobilizes the flap, and all edges are freed by undercutting.

When healing has occurred, the leg is put up in plaster until such time as union is definitely bony.

Method VII.: Excision of the Knee Joint.

As an operation for drainage purposes excision of the knee joint is undoubtedly effective as far as immediate results are concerned. Opinion varies, however, as to its advisability for two reasons: Firstly, on account of the possibility of an osteomyelitis supervening by infection of cut surfaces; secondly, from the fear of later non-union, particularly where separation of the sawn surfaces is desirable in combating severe infections. It is difficult to view published results in true perspective. The records of forty-two cases collected by Barling[5] in Rouen show that eight cases were followed by amputation and that thirteen patients died with or without amputation. It should be remembered, however, that many of these cases were complicated by bone injuries. Max Page[11] states that the orthopædic results of excisions he has seen, leave much to be desired.

As the operation accomplishes nothing more than the last method—transverse arthrotomy, I have not employed it in cases of arthritis without bone injury, for the above reasons.

Method VIII.: Willems's Method—Drainage Arthrotomy and Movement.

Willems's method of treatment of acute suppurative arthritis by drainage arthrotomy followed by free active movement of the joint[6] is diametrically opposed to all established principles and the claims made for it excited a good deal of interest when first published. Willems had been so impressed by the favourable results following immediate active mobilization in injured and wounded joints that he was led to extend the treatment to suppurating cases. His article includes both classes. He claims that "active mobilization is always possible" (in arthritis). I have carefully studied all available papers dealing with this subject and the impression gained is that others have been unable to obtain equally favourable results. Thus, David[7] states that of thirteen infected and drained joints "we were able to start immediate active mobilization in only five" and that other cases were brought to "a precarious condition from ill-advised attempts" (to apply the treatment).

Poole and Jobson[8] conclude that while "early non-virulent infections usually do well, in severe or long standing infections, especially with bone involvement, the treatment has not proved as satisfactory."

I have been able to find only one series of cases in the British literature, that of Everidge,[9] apparently a convert to the Willems system. Of twenty-three patients ten had popliteal abscesses drained, but there were no deaths and 50% of recoveries with movement occurred.

I have had no personal experience of the method and in most hands the results have not been very impressive. I doubt if sufficient emphasis has been laid upon the vast difference between the wounded and the infected knee joint. The former often responds admirably to early active movement, a joint infection, I believe, but seldom.

Genereal Considerations.

The most severe infections naturally call for the most radical measures, but it must not be inferred that every case in which a joint is found to be definitely infected, demands operation on the lines of Method V. or Method VI.

Whatever method is employed (excepting that of Willems) complete immobilization is imperative. To appreciate this it is only necessary to note the elevation of temperature and pulse which accompanies any accidental departure from this rule.

The factors which are of influence in determining the selection of a method are four in number.

The first is the duration of the infection. A patient seen late, when infection has been established for many days and the popliteal space already full and boggy, is obviously unsuitable for any temporizing measures such as parapatellar incision.

In the second place the age of the patient and his general health, the presence or otherwise of other suppurating wounds or loss of blood and the level of his morale are all to be taken into account. Loss of morale and will to win through will sometimes determine an amputation against all other indications. Consideration of the foregoing leads to an estimate of the patient's probable resistance to his infection. It must be admitted that the difficulty of assessing the true value of these factors is very great.

The third factor is the type of infection. This calls for bacteriological and cytological studies. In general it is undoubtedly true that streptococcal infections are the most serious. To this rule there are doubtless exceptions and it is impossible for the bacteriologist to do more than determine whether the strain is a hæmolytic one or otherwise. The infection is often mixed, staphylococci and streptococci. The presence of *Bacillus welchii* does not appear to be of ill-omen. Relatively few organisms and evidence of phagocytosis are possibly indications that an infection is well resisted.

The fourth factor is the general clinical picture presented by the patient and the knee joint after several days of illness—in fact the sum of the two preceding factors.

The temperature and pulse rate, particularly the latter, the amount of pain suffered and the control or otherwise of any night starts by careful readjustment of splints, appetite, sleep and maintenance of nutrition and good spirits, all are to be taken into consideration as affecting prognosis and treatment. The patient who eats well, sleeps well, suffers little pain and whose pulse remains below 100, even though the temperature runs to 37·8° C. or 38·3° C. (100° F. or 101° F.) is probably standing up to his infection. If at the same time neither the swelling of the joint nor local tenderness is increasing and the popliteal space remains flat, one would be content that the drainage was satisfactory whatever the method employed.

It is unnecessary before such a meeting to stress the need for immobilization. A Thomas knee splint is, I think, more satisfactory than the posterior half-ring or a Hodgen. A moderate degree of fixed extension that does not produce pain by traction on inflamed ligaments and yet controls movement and night starts, is desirable. Slings are preferably of perforated zinc; they are more rigid than fabric and are easily boiled. Support should be afforded the popliteal space itself to prevent both œdema and any tendency to hyperextension. Throughout the conduct of a case the popliteal space is carefully inspected and palpated at each dressing. I am, however, a firm believer in rather infrequent dressings and have already referred to this question. Whatever type of arthrotomy has been performed, the Carrell-Dakin method has a definite value in diminishing toxæmia and I think it is wise to employ this aid, but the tubes should pass across the joint only from side to side, not antero-posteriorly.

Discussion of Method to be Employed.

I regard repeated aspirations as being without value in established suppurative arthritis. Whilst it is certain that some few mildly infected joints may recover under this treatment if seen and immobilized early, it is outside my experience for a frank suppurative arthritis (other than pyæmic) to respond to this method.

Barling (*loco citato*) states that he would deprecate it unless "the fluid showed a low corpuscular element, a moderate polymorph count and a sparsity of infective organisms." A risk run by persisting with this treatment is that the posterior compartments may become definitely infected, while the fluid withdrawn by puncture yet shows an only slightly increased turbidity. This method should be reserved for the very early case in which with the above findings, the signs and symptoms of inflammation are minimal.

Methods II. and III. will rarely be followed by recovery without the evacuation of collections of pus posteriorly. Such collections endanger life by toxæmia, secondary hæmorrhage and the risks attendant upon amputation if it become necessary.

In regard to Methods IV., V., VI. I believe that when arthrotomy is judged necessary at all, it should be by incisions designed to favour drainage from the posterior compartments, as in Methods IV., V., VI. For this immediate purpose there is probably little to choose between these, if the posterior incisions in Method IV. are well placed. Where posterior incisions have been made, however, it is not easy to carry out subsequently a transverse arthrotomy and flexion when this is judged expedient on account of grave toxæmia.

Such an objection does not apply to Method V. (antero-lateral arthrotomy). Here a further incision, which unites the vertical limbs and is deepened through the patellar ligament and fat pad, at once converts it into a transverse arthrotomy. For this

reason I prefer to carry out drainage arthrotomy by Method V., reserving Method VI. for the type of patient who either from the outset or during the progress of the case, impresses me as suffering from an unusual degree of toxæmia.

It must be admitted that the treatment of a patient who has been submitted to transverse arthrotomy, makes considerable demands both upon the patient and surgeon. To the patient it represents a rather long and trying illness, with probably a number of anæsthetics for dressings, together taxing his morale to no small extent. Nevertheless, in the end most patients express the greatest gratification if the leg be saved.

Results.

To the sixteen cases of transverse arthrotomy for severe sepsis previously published[10] I have only one more to add. The results in the seventeen cases were as follows:

1. Amputation after a month, recovery.
2. Amputation after four days, recovery.
3. Amputation after sixteen days, recovery.
4. Recovery, walks well with stiff leg.
5. Recovery, firm union of doubtful nature.
6. Recovery, nature of union unknown.
7. Recovery, nature of union unknown.
8. Recovery, nature of union unknown.
9. Amputation, six days later, recovery.
10. Recovery, firm union of unknown nature.
11. Recovery, able to walk.
12. Recovery, firm union on discharge.
13. Recovery, slight union on discharge.
14. Amputation, death six days later from septicæmia.
15. Recovery, nature of union unknown.
16. Recovery, nature of union unknown.
17. Recovery, firm bony ankylosis.

In the earlier cases the importance of bone injury was underestimated and excision should have been the operation performed in Case II. and Case III. I have reason to believe that in no case did firm bony union fail to occur.

Arthroplasty.

A knee which has been drained by transverse arthrotomy cannot subsequently be mobilized by arthroplasty as the patellar tendon is not sutured in following the ordinary technique of straightening. It would not be an easy matter subsequently to mobilize this tendon sufficiently to do so. For this reason the surgeon who envisages a later athroplasty, would be wise to employ another method of arthrotomy. I am by no means sure, however, that such an objection is a very weighty one.

I am fully aware that there is a tendency to hesitate before employing measures that must inevitably result in loss of mobility. In an established infection it is life and limb that demand consideration, not function, but I am not in agreement with those who maintain that for this very reason immediate amputation is the wisest course. To my mind a painless bony ankylosis of the knee is infinitely more acceptable to most men than any artificial leg. Experience alone will tell us when to open and when to amputate and the suppurating knee offers full scope for the exercise of sound judgement in this respect.

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PRINCIPLES UNDERLYING TREATMENT BY RADIUM.[1]

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AMONGST the considerations that prompted Dr. Saltau and me to analyse the results of radium therapy at the Women's Hospital during the past five years were the following.

Victor Bonney states publicly that he has little time for radium in the treatment of carcinomatous cervices. Even allowing for Bonney's extraordinary dexterity in performing hysterectomy and bearing in mind the statement sometimes made that the English methods of using radium are not the best (in regard to which I have not yet been convinced), Bonney's attitude towards radium is one over which it is necessary to ponder. On the other hand we have the opinion issued authoritatively on behalf of the staff at the important Memorial Hospital, New York, that the most appropriate treatment of cervical carcinoma in all stages is treatment by radium.

With two such extreme viewpoints, wherein does the truth lie?

Another point that may be worthy of note is that during the past twelve months radium has

[1] Read at a meeting of the Gynæcological and Obstetrical Section of the Victorian Branch of the British Medical Association on November 25, 1926.

suffered a decline in price and in popularity in the United States of America. Whether this is due to diminished advertising by radium producing companies or to the fact that radium is not now purchased so freely by the medical practitioner, is not easily comprehended. At all events there has been a great diminution in the quantity of radium sold to the American medical profession, apparently well able to afford it, during the past twelve months. Will a purely economic explanation of the above fact suffice?

The most ardent advocates of radium therapy stress the fundamental importance of technique. In other words, they say: "If you don't follow our technique you will get poor results or no results at all." We have therefore endeavoured to compare our results with those achieved by different techniques abroad.

Again, an up-to-date deep therapy apparatus is shortly to be installed at the Women's Hospital. Future results of combined radium and X radiation therapy will be able to be compared with the results of our cases to date in the majority of which radium alone has been used.

Unless a tolerably clear conception is given of what forms of radiation are being used in this form of therapy, radiologists should not exhibit any deep chagrin if their non-radiological colleagues confuse the radium rays with other forms of rays such as stingrays or even with the electronic reactions of Abrahams; I have heard the latter confusion before now.

I have endeavoured to summarize on the screen the most important physico-chemical properties of radioactive substances of which radium, radium salts and radium emanation are important members.

Some radium centres use radium emanation very largely. Amongst the reasons for preferring the emanation as a source of radioactivity are: (i.) Radium emanation has no intrinsic value, as it will not "keep" and therefore must be used within a few days; so if a tube happens to be carelessly thrown out, no danger of a heavy financial loss is involved. It can thus be sent through the post, a practice frequently used at the Radium Institute, London and also at the Manchester Radium Institute. Though the emanation is dissociating every second, it is a simple matter to calculate the element value at any specified time of a given quantity of emanation. (ii.) As the volume of emanation in equilibrium with 1 gramme of radium is very small (1 curie at N.T.P. of pure emanation occupies a volume of only 0·6 cubic millimetre).

A large dose can therefore be kept in small glass tubes. Some of these tubes are sufficiently small to permit of their being buried permanently in the tissues. These emanation tubes for permanent burial are known as "seeds."

The glass containers permit of the escape of the highly biologically active β particles.

When radium is kept in platinum tubes, the platinum, besides being very expensive, absorbs all the α and most of the β radiations. On the other hand, many radiologists object to the use of emanation in small glass tubes, for the very reason that the β rays which are permitted to escape, have such an intense biological action that they produce a cauterizing effect and this it is wished to avoid. Lately, to overcome this difficulty, the emanation is being enclosed in small gold and platinum tubes which filter off the necrosis producing rays. The action of radium on normal and pathological tissues is a big question, but briefly it can be stated that the principle underlying radium therapy is that certain pathological tissues are more susceptible to the action of radium than normal tissues. The effect is similar to the so-called biological "law" of Bergonié and Tribondeau who in 1906 enunciated for X radiation the generalization that immature cells and cells in an active state of division are more sensitive to X rays than are cells which have already acquired their fixed, adult, morphological or physiological characters. The question as to whether X and radium radiations ever exercise a stimulating action on normal or abnormal tissues is still unsettled. I personally regard the evidence that has accumulated on this question as being against the existence of any stimulating dose. The action on tissues of the three components of the radiations from radioactive bodies, namely α, β and γ rays, varies. The relative biological effect produced by these rays has been stated as in the ratio of 10,000 : 100 : 1.

From the practical point of view of radium therapy, the α rays do not enter into our consideration, as they are so easily absorbed by the walls of even the thinnest container.

The β rays, however, vary widely in their degree of penetration; the "soft" β rays being rapidly absorbed, while the "hard" β rays are capable of relatively considerable penetration and so have a distinct range of biological effect. The "hard" β rays are reduced to 6% of their original value in the passage through one centimetre of tissue.

The biological action of these β rays is comparable to those obtained by direct cauterization and, while the effect is more pronounced on certain pathological tissues, it is also exerted on the normal structures.

Since it now appears to be widely accepted that vitality of the normal tissues is just as important in combating the spread of malignant disease as it is, say, in bacterial diseases, it will be seen that one of the principles underlying radium therapy is the correct estimation of the dosage and exposure necessary to bring about the death of the pathological cells, without appreciably affecting the vitality and functions of the normal and so enabling repair to be accomplished satisfactorily. The destructive cauterizing action of the β rays not only on the abnormal but also on the normal tissues therefore indicates that they should be used with considerable discretion.

We have a means of controlling the quality and quantity of β radiation emitted from radium and

this by filtration of the rays through various metals. Filtration is, therefore, a very important factor in radium technique. The γ rays are less powerful biologically than the β particles—1:100 it is estimated. They exert their effect indirectly. When γ rays are absorbed by the matter, a phenomenon known as electronic emission takes place. This electronic emission is the liberation of electrons, that is, β rays, from the atom of the absorbing body and it is these electrons or secondary β rays which really produce the biological effect of γ rays. It will therefore be seen that γ rays produce biological effects only when they are absorbed. The γ rays are said to exert a more selective action on pathological tissues (compared with normal tissues) than do the α or β particles. The γ rays, then, not being directly caustic in their action like β rays and also exerting a selective action on pathological tissues, are considered by many radiologists to be the most valuable from a therapeutic point of view.

It is of interest to note the changing conceptions of the manner in which radiations produce their therapeutic effects. This transition has been reviewed by Professor Lazarus Barlow, of the Middlesex Hospital. In the beginning radiation was regarded as a species of specialized caustic, then came the stage of an endeavour to determine a directly selective destruction of cancer cells and there has recently been acceptance by authorities throughout the world of the conception of radiations as agents whereby the resistant factor of the normal tissues is stimulated and reinforced. British radiology, led by Knox, Colwell and Russ, has for many years insisted that the destruction of cancer cells by radiations is much more than a purely physico-technical task and that there are other biological factors besides the direct destruction by the rays of the cancer epithelium. This explains why the "lethal" dose has not been viewed with favour in Britain. This "lethal" dose now appears to have received a universal quietus and healthy conservatism received a vindication once again.

Dangers of Radium.

A word or two might be said *à propos* of the effects of radium radiations on workers with radium. Persons who habitually handle or are constantly in contact with radium apparatus may be affected in two ways, locally and constitutionally.

Firstly, local changes in the hands may occur and these local changes are said to be due in the main to the secondary β rays. In the early stages the skin of the hands become roughened and non-elastic There is a loss of tactile sense. Sensations of heat and cold are exaggerated and extremes of temperature are very badly borne.

Later, fissuring of the skin occurs; warts and corns develope; when they separate, indolent ulcers of a peculiarly intractable character are left. The nails become brittle and irregularly thickened and their longitudinal striation is greatly exaggerated.

The general changes are due to γ radiation. All workers suffer at the end of the day from a feeling of general fatigue and exhaustion, though some are much more susceptible than others. Blood examination invariably reveals a leucopenia, the white cells being less than 5,000 per cubic millimetre. There is a slight diminution of the red cells, though this is generally compensated for by an increase in the colour index. Working with radium (as with X rays) is certainly not free from danger to the health of the workers and I think that this fact should be definitely appreciated by hospital committees and honorary staffs.

Methods of Using Radium.

The various methods of using radium may very roughly be grouped as follows:

(i.) External application, to either surface of growth or through the skin, as for example when radium is placed in the vagina in contact with the surface of a cervical carcinoma. The radium may be used either as the salt or in the form of emanation.

(ii.) Burying by puncture of metallic tubes (containing the salt or emanation) into a growth and withdrawing them after a certain number of hours.

(iii.) Burying of very small bore glass tubes or "seeds" containing radium emanation and leaving them there permanently, when they either slough out or are surrounded by fibrous tissue.

(iv.) Employing the so-called "surgery of access" before implanting radium. As for example the method of Daels, of Ghent, Belgium. By open operation he places a chain of radium tubes extraperitoneally along the iliac glands.

Technique of Radium Treatment.

The adequate description of any radium technique is important, as it is claimed that the results of treatment by radium are largely dependent on the method of application. It follows from this that each one of the means of using radium that I have previously enumerated, might therefore be regarded as a separate therapeutic agent.

The accurate description of the radium dosage used in any case requires the knowledge of several factors:

1. The equivalent amount of radium element used, *exempli gratia*, 100 milligrammes of Ra Br_2 2H 20 = 53·6 milligrammes of radium element; 100 milligrammes of Ra So_4 = 70·2 milligrammes of radium element; 100 milligrammes of Ra Cl_2 = 76·1 milligrammes of radium element.

2. The length of the container.

3. The distribution of the radium in the container.

4. The composition and thickness of the walls of the tube.

5. The composition, distribution and thickness of any screening; if more than one screen is used, these should all be accurately detailed.

6. The method by which the radium was applied either externally or by puncture: whether any surgery of access was required.

7. Whether any distance screening was employed; vaginal packing is a form of distance screening.

8. The hours of application for each treatment. (The use of the expression "milligrammes hours" is not to be encouraged. Though $Q \times T$ may be a constant it certainly does not follow that the biological effect R is going to be constant, *exempli gratia* Q high and T low may produce a very different effect from T high and Q low.)

9. Intervals between treatments.

10. Details of subsequent treatments.

As the time at my disposal is limited I shall confine my remarks to the technique used at the Women's Hospital for cervical carcinoma only and then very briefly describe the techniques used at various important radiological centres abroad for the same condition.

Technique Used at the Women's Hospital.

The technique used at the Women's Hospital is largely as follows:

Two large brass tubes each containing 50 milligrammes of radium bromide are placed in the vagina against the surface of the growth. The amount of radium used is therefore 100 milligrammes of the bromide = 53·6 milligrammes of element.

The filtration is 0·5 millimetre of silver surrounding each small tube of 25 milligrammes of radium bromide and one millimetre of brass enclosing two of the silver tubes.

The above filtration is sufficient to absorb all but the hardest primary β rays, that is from the radium bromide.

The secondary β rays which are produced in the passage of the rays through the brass and silver walls are absorbed by one millimetre of an aluminium container. The aluminium container in turn is enclosed in a thick rubber finger stall; this permits ease of introduction and acts as an additional filtration against the secondary β rays. Vaginal packing is employed to increase the distance of the tube from the rectal and vesical mucous membranes in order to reduce the chance of a proctitis or cystitis, both of which may be sequelæ to radium treatment in this situation. The rationale of this packing off is the inverse square law of radiation intensity which states that the intensity of radiation at any point is inversely proportional to the distance from the radioactive source, that is, $I \propto \frac{1}{D^2}$

The Use of Radium Abroad.

The Radium Institute, London.

At the Radium Institute, London, the treatment of cervical carcinoma varies with the type of growth. In the endocervical type, the most malignant, a tube of 75 milligrammes screened with one millimetre of silver is inserted in the canal for twenty-four hours. Four to six tubes of ten milligrammes, screened with 0·3 millimetre of platinum are inserted by puncture into the thickened cervical walls for twelve hours. If there be definite infiltration of either or both broad ligaments, tubes of 50 milligrammes screened with one millimetre of silver, are inserted into the infiltrated area for twenty-four hours. In addition they irradiate externally both iliac fossæ and above the pubes with 200 milligrammes screened with two millimetres of lead for twenty-four hours; the latter being directed against parametrial and glandular spread. Deep therapy will act satisfactorily as a substitute for this latter radiation. In the flattened ulcerated type, a mould is taken of the cervix with dental modelling and in the grooves of the modelling corresponding to the ulcer are placed numerous ten milligramme tubes screened with 0·3 millimetre of platinum and the modelling is left on for twenty-four hours. In the fungating type as much of the growth as possible is removed by excision, curettage, cautery or diathermy and then 50 milligrammes screened with one millimetre of silver is inserted into the cervical canal for twenty-four hours and any outlying nodules are pierced by ten milligramme tubes screened with 0·3 millimetre of platinum and left there for twelve hours. External radiation to the parametrium is also carried out in both these techniques.

Memorial Hospital, New York.

At the Memorial Hospital, New York, it is considered that radium is the most appropriate treatment for cervical carcinoma in all stages. Massive doses are used, with a combination of (i.) the "bomb" technique (a bomb contains 1,000 millicuries of radium emanation filtered through one millimetre of platinum and placed in the vagina), (ii.) implantation of bare radon seeds and (iii.) external radiation to the parametrium. With this combined treatment the average case receives from 9,000 to 18,000 millicurie hours.

Some radiologists object to the use of the bare emanation tubes. They contend that it seems irrational to scatter ten, twenty or more minute foreign bodies through the tissues, when it is known that one of the causes of cancer is prolonged irritation and secondly, the glass walls are not thick enough to filter out sufficient of the β rays, hence there is frequently produced an intense local reaction followed by sloughing, great pain and heavy fibrosis which cuts off all circulation to the part and often results in further necrosis. It is estimated that a glass capsule containing one millicurie of radon, if buried permanently in a growth, emits 132 millicurie hours of radioactivity in its passage to complete decay and that this dose is sufficient to excite necrotic changes in one cubic centimetre of immediately surrounding tissue.

Saint Bartholomew's Hospital, London.

At Saint Bartholomew's Hospital Malcolm Donaldson takes a microscopical section of the growth in every case in which radium is applied for the first time. The needles are placed in and around the growth with as far as possible about a centimetre of tissue between each needle. The longer needles are pushed outwards as well as upwards into the base of the broad ligaments. The amount of radium generally used is as follows: Eight large needles, approximately six centimetres

long, each containing three milligrammes of radium element with a filter of 0·5 millimetre of platinum; twelve or thirteen smaller needles, each containing two milligrammes of radium element with a filter of 0·5 millimetre of platinum; the total number of milligrammes is 48 to 50, these remain in place for 144 hours. This vaginal application is repeated at the end of about four weeks. This technique Donaldson was using at the end of 1925.

Some radiologists are against the burying of needles. They contend that the burial of needles may produce sepsis under conditions very suitable for the growth of organisms; that the normal tissues themselves while undergoing repair after the trauma may be affected by the radium to an undue extent, as it is well known that radium affects cells which are about to go into mitosis; that any incision, even the introduction of needles, may disseminate the growth.

Radium Himmett, Stockholm.

The Radium Himmett at Stockholm is an important centre of the world's radium therapy. A small hospital of thirty-two beds, founded in 1910 for the radiological treatment of cancer, it is maintained both by private subscription and also by the Swedish Government. It is under the direction of Professor Gösta Forsell, assisted by Dr. James Heyman and results from this source always receive careful consideration throughout the world. There is a well organized "follow-up" department attached to this institution. An interesting feature is the fact that the Swedish Government by Act of Parliament pays the travelling expenses of poor patients to and from the Hospital and by this means a careful supervision is kept of all patients treated. In the technique here all operative treatment prior to radiation is absolutely contraindicated. It is considered that the practice of taking microscopical sections before and after treatment is exceedingly dangerous. By using heavy filtration of three to four millimetres of lead, only the γ rays are used. Forty milligrammes of radium element are placed in the uterus, together with 55 milligrammes in the vagina and both applications are left *in situ* for thirty-two hours. An anæsthetic for the insertion of the radium is given only in virgins and highly nervous patients. A week later the same dose is applied; this time for twenty-four hours. Results are claimed as follows: 40·5% of the patients with operable and border-line tumours have been symptom-free at the end of five years. Of the patients with inoperable tumours 16·6% have been symptom-free after five years and of the remaining patients with inoperable tumours 20% to 25% have remained symptom-free for at least three years. At the Radium Himmett radium is considered the best method of treating cervical carcinoma in all stages. It will be noticed that with this technique there is no burial of needles.

Radium Institute, Paris.

At the Radium Institute, Paris, said to be the world's foremost radium centre, Professor Claude Regaud[1] filters the radium heavily and applies it in the cervix and vagina, instead of burying the needles and leaves it *in situ* for a week at a time. Regaud[2] and his coworkers conclude that surgical treatment should be applied when practicable to adeno-carcinoma of the cervix, in cancer associated with infection of the adnexa and in cases rebellious to radiotherapy. Radium alone is indicated in cervical carcinoma other than the type mentioned above, with the parametrium intact. X radiation is indicated alone in those inoperable cases in which the correct use of radium is not practicable and also for recurrence after hysterectomy. Association with X radiation is suggested if the parametrium is affected, but still accessible to radium. They endeavour to clear up secondary infection before commencing radiotherapy. Lately Regaud[3] has been using radium at a distance. Four grammes of radium element are placed at a distance of ten centimetres from the skin, the skin is divided into two to seven fields with one or two daily exposures from twelve to fifteen days. He claims that cancerous infiltration of the pelvis has disappeared entirely and this after the failure of other techniques. This method did not induce any notable, local or general reaction.

It is of interest to note that in the radium treatment of cancer in other situations, for example the tongue, Regaud advocates the principles of multiplication of radioactive foci, small doses of only a few milligrammes at each focus, long exposures up to a week and heavy filtration of 0·4 to 0·5 millimetre of platinum. He prefers small needles with heavy filtration to the bare emanation tubes in order to avoid the necrotic action of the β rays and to utilize the γ rays with their supposedly selective action. He advocates multiple radioactive foci inserted into the growth by the puncture method in order that the dose will be equally distributed through the cancer tissues and the long exposures so that at some time or other all of the malignant cells will be subjected to the radiation during mitosis. At this time they are most susceptible to its damaging influences.

Conclusion.

So it will be seen that of the several world authorities on radium therapy, that is, Claude Regaud, of Paris, Gösta Forsell, of Stockholm, Hayward Pinch, Malcolm Donaldson, of London and Bailey, of the Memorial Hospital, New York, each and all are advocating different techniques and thus conclusively demonstrating that the last word has not yet been said on this interesting subject.

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SUMMARY OF RADIUM TREATMENT AT THE WOMEN'S HOSPITAL, MELBOURNE, DURING THE LAST FIVE YEARS.[1]

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I PROPOSE in this short paper to make a survey as far as possible of the results of the radium treatment carried out at the Women's Hospital during the last five years or since the beginning of 1921 when a supply of radium was purchased and treatment instituted. No patients seen and treated as late as this year, 1926, are considered.

With the kindly concurrence of Dr. Dennis who has carried out the treatment in practically all the cases for the above period, I made an attempt some months ago to trace by means of circular all patients who had passed through the "radium beds." A few non-gynæcological conditions such as recurrences after radical amputation of the breast for mammary carcinoma are not included.

Unfortunately the returns from the investigation were not so complete as we would have desired and a large number of letters were returned, so that these patients cannot be traced. It is probably reasonable to assume that the great majority of these have died.

During the period under review, excluding the few with non-gynæcological conditions mentioned above, 164 patients have been treated for the following conditions:

Carcinoma of cervix	134
Carcinoma of body of uterus	6
Carcinoma of vagina (apparently primary)	6
Carcinoma of vulva	4
Endothelioma of urethra	1
Sarcoma of ovary	1
Recurrent sarcoma subsequent to hysterectomy for sarcoma of body of uterus	1
Sarcoma of cervix	1
Sarcomatous polypus	1
Fibrosis uteri and subinvolution	4
Hydatid mole (prophylactic after evacuation of uterus)	1
Submucous fibroid	1
Fibroids *plus* carcinoma of body of uterus	2

It will be seen that of the total of 164 tumours, 134 or approximately 80% were carcinomata of the cervix, so that necessarily the greater part of this paper will be devoted to a consideration and analysis of the treatment and its results in this condition alone.

Approximately one-third of these patients came under my observation while I was acting as Medical Superintendent. As to the remainder I have had to rely on replies to the circular and the case records.

[1] Read at a meeting of the Gynæcological and Obstetrical Section of the Victorian Branch of the British Medical Association on November 25, 1926.

Carcinoma of the Cervix Uteri.

Of the total of 134 tumours, 112 or 84% were regarded as inoperable or in a few instances as border-line cases and were submitted to radium treatment alone. It is remarkable that such a small proportion of cases of carcinomata of the cervix when seen for the first time can be definitely pronounced to be operable after the ordinary clinical examination. In this series 22 or only 16% were regarded as operable and submitted to operation. Two of these on exploratory laparotomy were found to be more extensive than anticipated and operation was abandoned. Some of these were given preoperative radium treatment and others were treated subsequent to operation, but these will be considered in detail later.

The above figures relating to inoperability approximate to those given by various observers with the exception of Bonney who estimated only 36% as inoperable, but figures from the Cancer Hospital, London, show an inoperable rate of 90%; others vary from 60% to 70%. As regards the so-called border line cases there appear to be two distinct schools, one, prominent among which is Bonney, advocating radical operative treatment in preference to radium and another school, largely American, which claims better results with radium alone.

We can now make an analysis of the 112 patients treated at the Women's Hospital, whose tumours were classified as inoperable and border-line and treated by radium alone. I would like to have done this in more detail, but unfortunately the end results are not definitely known in a large number, so that we can only presume that the large majority of these have died. This presumption is strengthened by the indication of unfavourable progress from a study of the card records. In this category are seventy-one patients and it has been established definitely that thirty-two others have died. There remain nine who have apparently responded fairly well to treatment. Unfortunately owing to the comparatively short time a supply of radium has been available, there are among them no patients who have been free from symptoms and recurrences for a period of five years—the usually accepted standard of cure. One of them has, however, been symptom free for a period of four years; two have been quite well for two years and the others for periods varying from twelve months to two years. One interesting case is that of a patient whose progress I have been able to follow personally. It is well worth recording. A young nulliparous married woman, aged 30, first came to the hospital nearly two years ago complaining of irregular hæmorrhage.

On examination a fairly large cauliflower growth of the cervix was discovered and this was deemed inoperable by the surgeon. On section it was pronounced a rapidly growing epithelioma. She was submitted to radium treatment on two occasions at an interval of about two months. Hæmorrhage was immediately checked and when some months later the cervix appeared to be quite normal and mobile, the question of operative treatment arose. When examined under anæsthesia, it was thought that a gland could be palpated and it was then decided to recommend

deep X ray therapy. This was carried out at the Alfred Hospital.

The patient is still quite well and although barely two years have elapsed since treatment was first instituted, it is hoped that the result may be permanent. The result is all the more pleasing, since it is generally accepted that the younger the patient, the worse the prognosis.

This raises the question of the advisability of supplementing the application of radium with X ray therapy. I am led to believe that the action of radium becomes almost negligible at any greater distance than four to five centimetres and thus it seems that although a satisfactory local result may be achieved as regards the cervix, any glandular or parametrial involvement may escape the penetrating action of the rays. It seems reasonable to advocate that a supplementary exposure to deep X rays might improve results. I have in mind the case of an old lady who reported at the hospital a few months ago.

This patient displayed a large fungating mass in one groin, with obvious glandular involvement in the other groin. She was in the last stages of cachexia and had been treated two years previously for an extensive growth of the cervix, with the result that her hæmorrhage and discharge ceased. On examining her I was surprised to find a small atrophic and normal looking cervix which along with the uterus seemed fairly mobile. Yet there was extensive glandular involvement and it is possible that if she had received supplementary X ray therapy, the lymphatic spread might have been arrested.

We hope that this supplementary X ray therapy will be available in a few months at the Women's Hospital when an up to date X ray equipment will be installed. The combined method of treatment appears to be well worth a trial.

The above hopeful results in nine cases only or 8% of the inoperable growths, do not seem very impressive, but it must be remembered they would have been regarded as hopeless and nothing would have been done, if radium treatment had not been instituted. A proportion of them were far advanced and the results do not compare altogether unfavourably with those from other sources. In the annual review of gynæcology and obstetrics for 1925 by De Lee and Polak, figures from the New York Institute for Malignant Diseases taken over a five year period showed that there were 253 advanced cases and among these only two patients were clinically cured, five were improved, 95 unimproved, 106 died and 45 were not traced. Of thirty other patients with slight extension to the vaginal walls 15 or 50% were well. From another American source in a four year period, 1917 to 1920, we find that of 100 patients treated there were alive and clinically cured eight or much the same result as obtained at the Women's Hospital.

Heyman, of Stockholm, in a paper read at the Annual Meeting of the British Medical Association in England last year, was able to quote better results and claimed that 16·7% of 234 patients remained free from symptoms after five years.

Though cures as a result of radium treatment are few and far between, satisfaction can be derived from the undoubted palliative effect in a large number of even the most advanced cases. In the large majority hæmorrhage ceases a week or two after the institution of treatment, the offensive discharge becomes less and in some cases there is definite relief from pain. The life of the patient, even though the radium may have no curative action, is made much more comfortable. If by this palliative effect in advanced cases the patient is enabled to regain temporarily her strength, if life is prolonged and if she is freed from the irritating and offensive discharges which are a source of annoyance to herself and everyone else in her household, then the treatment is justified.

In our series of 112 inoperable cases hæmorrhage was permanently arrested in 46 or 41%. In quite a number of the others the patients reported that the hæmorrhage had ceased for a few months, but had then been followed by a recurrence.

In 35 or a fraction over 30% the discharge entirely ceased as a result of treatment and in others it became much less and in 18 or 16% the relief from pain was admitted.

Heyman, of Stockholm, in his paper from which I previously quoted claimed that in a series of 342 patients suffering from bleeding at the commencement of treatment 61·7% were free from hæmorrhage after six months, 35% after twelve months and 23% after two years. As regards the effect on the discharge, 66% were free after six months, 40% after one year and 32% after two years. Ability to work was regained by 61% of his patients after treatment and 30% were able to continue after two years.

Ill-effects from radium were rarely noticed at the Women's Hospital. A few patients in my own experience complained of nausea whilst being exposed, but this subsided shortly after the removal of the radium. The development of fistulæ has been a rare occurrence and in the three or four cases in which it did occur, it was doubtful whether the radium could be held in any way responsible, owing to the advanced nature of the growths. All authorities appear to be agreed as to the risks of treating carcinoma of the cervix with radium where there is extensive involvement in the region of the base of the bladder or urethra and also in the posterior wall, but in these cases the dose was always reduced. In a few cases there was evidence of bladder irritation which, however, rarely persisted and could be attributed to the effect of the radium.

A troublesome proctitis occurred in two or three instances, but this was only temporary.

Six patients with growths clinically regarded as operable were given radium prior to operation. All received one dose at intervals varying from four to six weeks before operation was undertaken. An analysis of these shows that three are known to be well, one after three years and two after two years. One died shortly after operation from shock, another died nine months subsequent to operation and was reported to have developed a vesico-vaginal

fistula and the sixth was quite well for three years, but then developed a recurrence in the vault of the vagina, was treated with radium and then disappeared. This small series has thus given fairly good results, 50% being quite well after two to three years, but they all suffered from early growths.

There appears to be a difference of opinion as to the wisdom of preliminary radiotherapy before operation is undertaken. Some advocate it with the idea of rendering border-line growths operable. In many cases it is admitted that the operation is rendered more difficult on account of the fibrosis which takes place. As against this it is maintained that radiotherapy makes for diminished oozing in the perivaginal and pericervical tissues, but the opposite has been the experience of others.

Sixteen patients were given radium after being submitted to operation. Four or 25% of these when last seen were doing quite well. One was operated on in 1922 and is still symptom free, another has been well after four years, a third was operated on eighteen months ago and is still apparently doing well and the fourth is well after twelve months. One is definitely known to have died, three when last seen were not doing well and all trace has been lost of eight. Judging by the progress of three or four of these untraced eight up to the time they ceased to attend, it is possible they are still alive.

Carcinoma of the Body of the Uterus.

It is generally agreed that operative treatment is indicated in carcinoma of the body of the uterus in preference to radium since the ultimate prognosis is so much better than in carcinoma of the cervix. It tends less rapidly to infiltrate the uterine wall and lymphatic infection also proceeds more slowly. Consequently the incidence of inoperable cases is much less. Once a tumour becomes inoperable, however, the possibility of alleviation of symptoms by radium is perhaps less promising than in cases of carcinoma of the cervix, owing to its relative inaccessibility and it would seem that X ray therapy was more suitable.

Radium alone might, however, always be the most suitable treatment in the unduly adipose patient and where affections of the heart and lungs, old age and a bad general condition are contra-indications to operation.

Eight cases of carcinoma of the body come under review and in two of these operation was primarily undertaken for fibroids and the carcinomatous association was discovered subsequently. Of these eight patients three are quite well, two are dead and three were untraced.

Of the three patients that are quite well, one was treated with radium alone after a diagnostic curettage had proved the presence of malignant disease. This patient was treated on two occasions and three years later was quite well. A second had a supravaginal hysterectomy performed for a fibroid growth and radium was given subsequently. This was in 1923 and the patient is still well. The third apparently favourable case was that of a patient treated following a vaginal hysterectomy; she is well after four years.

Of the two patients known to have died one suffered from an advanced inoperable growth which at the time of treatment possibly involved the sigmoid. She was given radium as a palliative only.

The second death occurred in a patient on whom a supravaginal hysterectomy had been performed for a fibroid of the uterus in which an associated carcinoma was found only on section. She died three or four months later from uræmia.

Of the three untraced patients two were given radium subsequent to operation and did not return to the hospital and the third received one dose prior to operation. It is possible that a favourable result was attained in one or two of these.

Carcinoma of the Vagina.

Six cases of carcinoma of the vagina occurred in the series. As far as could be elicited these were primary, the cervix and uterus appearing to be quite normal. Two of the patients were submitted to operation and then given radium. The remainder were treated with radium alone.

Of the two receiving operative treatment one lived for two years after two doses of radium and had complete cessation of her hæmorrhage. The second received radium five months after her operation and did not return to the hospital subsequently.

Of the four who received radium alone, one received it purely as a palliative and she was subsequently sent to the Austin Hospital. Another was too ill for further treatment when she was seen again and a third was not seen again after her initial treatment.

The fourth patient received her first treatment only eighteen months ago and is now apparently quite well. I have personal knowledge of this patient. Her hæmorrhage and discharge were immediately controlled and she now enjoys perfect health, although one cannot be unduly optimistic owing to the comparatively short period since treatment was first instituted. It must not be forgotten that half of the patients were seen only in a very late stage when relief from symptoms was all that could be hoped for. As the prognosis after operation for cancer of the vagina is as a rule considered unfavourable, radium alone or possibly deep X ray therapy would seem to be the most suitable treatment even if only for its palliative effect.

Epithelioma of the Vulva.

There were four cases of epithelioma of the vulva. From a consideration of the results of these the outlook appears to be gloomy whatever the method of treatment employed. One patient was first treated by radical excision of the vulva with removal of the inguinal glands and was subsequently treated with radium. However, in a few months an extensive recurrence occurred in the glands and the condition

being hopeless, the patient had to be transferred to the Austin Hospital and died a short time afterwards. The other three were treated by radium alone; one is dead and the other two when last seen were not doing well. Not only was there no improvement in the growth itself, but there did not appear to be any great relief from symptoms. Burrows, of the Radium Institute in Manchester, in advocating the treatment of this condition by means of buried radium emanation tubes, advises that the great drawback is the subsequent difficulty of keeping the lesion clean and the prevention of the septic reaction which may be exceedingly painful. For this reason it has been thought advisable that operation should be the method chosen in the treatment of this condition.

The unsatisfactory results from the treatment of epithelioma of the vulva are borne out by quoting again from figures from the Radium Institute in Stockholm, although by improvement in technique, results are gradually improving. In a series 1910 to 1913, no patients of eight were symptom-free; six out of thirty in a series between 1916 and 1922 became free from symptoms and in a series of twenty-six cases, 1922 to 1924 eight became free. This shows a slight improvement. In all cases in these groups regional glands were treated with X rays and this added treatment seems to be specially indicated in carcinoma of the vulva whether the patient be subjected to preliminary surgery or not.

Miscellaneous.

Although this paper is in the main a consideration of the radium treatment of carcinoma, I will now deal briefly with the few non-carcinomatous conditions which have occurred in the series. One growth diagnosed on section as an endothelioma of the urethra was treated in 1923 with two small doses, fifty milligrammes for ten hours and again twenty-five milligrammes for two hours. When last seen a few months ago the patient was quite well.

There were four cases of sarcoma. One patient had a hysterectomy performed for a sarcoma of the body of the uterus and when a recurrence appeared in the vault of the vagina, she was treated with radium, but when last seen was not doing well. One was an early case of sarcoma of the ovary, diagnosed on section after operation. The patient was given supplementary radium and is still well. A case of sarcoma of the cervix did not respond to radium treatment alone and when the patient reported again at the hospital, the condition was hopeless.

The fourth was a patient who had had a previous hysterectomy for a sarcomatous polypus, but there was an extensive recurrence and no response was made to two doses of radium. In this particular case the radium appeared to have a stimulating action and when the patient was seen a few weeks after her first treatment, the growth appeared to have spread rapidly.

There were four cases of so-called *fibrosis uteri* or chronic subinvolution. The treatment of hæmorrhage in this condition appears to provide great scope for radium, but on account of the limited supply of radium at the Women's Hospital and the large number of patients with malignant conditions presenting themselves for treatment, it has been impossible to give much consideration to this condition. Of the four patients one has been free from hæmorrhage for two and a half years after one dose of one hundred milligrammes for twenty-four hours, another had had no trouble from hæmorrhage for twelve months and a third had had relief for six months. The fourth, a patient from the country who was sent down with a view to hysterectomy, was advised to have radium treatment and after one dose had a definite diminution in her hæmorrhage and probably would have responded quite well to a further dose, but she displayed a strange determination to have her uterus removed and this was done in another country town.

In radium we appear to have a fairly reliable method of treatment in this condition especially when the patient is unsuitable for operation or when there is an added operative risk.

One patient with a small submucous fibroid is included in the series and apart from the two cases of fibroids associated with carcinoma of the body of the uterus this is the only case of this type which has been treated by radium.

This particular patient did not desire a hysterectomy and after preliminary curettage of the uterus when the small fibroid was discovered, was submitted to radium and given a dose of fifty milligrammes for twenty-four hours, the tube in this case being inserted in the uterine cavity. She left for another State shortly afterwards, but we heard that she had been quite well for seven months, but hæmorrhage had then recurred and a hysterectomy had been performed. Possibly a further treatment would have sufficed. It appears to be generally considered that operation is the most suitable treatment in uterine fibroids, the reason being the frequent association of inflammatory conditions which contraindicate radium. It might, however, be exceedingly useful as a means of temporarily controlling hæmorrhage in an exsanguinated patient.

Dosage and Technique.

It is outside my province to discuss the matter of dosage and technique in general, as my colleague is dealing fully with these aspects, but possibly the paper would not be quite complete without brief mention of the dosage and technique used in the cases under consideration. In almost every instance the radium was packed closely against the cervix or occasionally in a cavity if such were present, care being taken if possible to interpose gauze between the tubes and the base of the bladder and rectum. In a few instances one tube was inserted into the cervix and in one or two cases right into the uterine cavity. The radium, contained in small silver capsules 0·5 millimetres in thickness, was enclosed in brass tubes of one millimetre and these were in turn enveloped by an aluminium covering also one millimetre, the whole being ensheathed in rubber. The usual dose was one hundred milligrammes of the bromide, the tendency for the first

year or two being for a shorter time period, about thirty hours. Latterly most patients were exposed for forty hours, unless there was definite infiltration of the anterior and posterior vaginal walls. As far as could be made out, there was no appreciable difference in results whether the larger or smaller dose was used. Whilst acting as House Surgeon at Saint Mary's Hospital in Manchester, I was fortunate enough to see a good deal of the work of Burrows, of the Radium Institute there. He used radium emanation needles which were buried in the substance of the growth. The advantages or disadvantages of this method I do not feel competent to discuss. One disadvantage was that the technique necessitated the routine administration of an anæsthetic.

Summary.

The following points are emphasized:

1. The small percentage of cures or possible cures in the inoperable or border-line growths.
2. The value of preoperative and postoperative radium treatment in the operable tumour.
3. The undoubted palliative action of radium in relieving symptoms in even the most advanced cases.
4. The unfavourable local response to radium treatment of vulvo-vaginal carcinomata.
5. The scope for radium treatment of hæmorrhage in chronic subinvolution of the uterus.

Acknowledgment.

I wish to thank Dr. Dennis for kindly permitting me to make this investigation and to tabulate the results for this paper.

INFANTILE DIARRHŒA.

By R. L. Forsyth, M.D. (Melbourne),
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The treatment of severe vomiting and diarrhœa in children seems so unsatisfactory and the theoretical discussions thereon so complicated, that the general practitioner is apt to avoid articles on the subject and to retreat to a conservative stand on his own experience.

I will not discuss the specific infectious diarrhœas. Dr. Webster, of the Melbourne Children's Hospital, and Miss Williams, of the Walter and Eliza Hall Institute, have given us the results of their beautifully complete work on dysenteric bacilli; but I wish to remark in passing that in 1912 I found a dysenteric infection in about 30% of the severe cases and their work confirms that finding.

I wish again to assert that other bacilli met with in the diarrhœal stools are pathogenic and to instance the Sonne bacilli which came into notice during an epidemic in Denmark. This bacillus is closely related to a bacillus described by me in 1912.

Whether many or all acute diarrhœas are infectious the following remarks hold good:

We know very little about the cause of diarrhœa, adult or infantile. A local irritant or an absorbed toxin commence the trouble, but what the nature of these imaginary toxins are at the outset, is extremely doubtful.

The products of normal digestion seem to stimulate the lower bowel; infants fed on thoroughly peptonized milk often develope diarrhœa. Dogs fed on the end products of protein hydrolysis maintain nitrogenous equilibrium, but develope diarrhœa. Possibly mere excess allows the lower bowel to be overstimulated and starts the trouble. Children who do not get enough water between feeds and must quench their thirst with milk, run this danger.

It is the present fashion to attribute the onset to the fermentation of an excess of some one food factor and to classify the diarrhœa as a carbohydrate, protein or fat fermentation and also to discuss the treatment as if a removal of this factor would cure the trouble. This theory seems to me to be quite untenable. Fermenting bacilli are not so easily discouraged, they have survived through the ages by their ability to ferment anything.

An adult recovers rapidly, unless an overwhelming toxæmia or a specific infection is present. A breast-fed child often reacts to treatment almost as quickly; any slowness of recovery is explained by the fact that its metabolic requirements are about two and a half times as great as in the adult, a check therefore being more serious to the more rapidly working digestion.

An artificially-fed child may also recover in seven or eight days and does so in the great majority of instances, but among the many cases we meet, there are always some in which recovery is prolonged, the resultant lowered resistance allowing of relapses and complications which often prove fatal. These cases occur in all climates and under all conditions and yield rapidly to no treatment.

Once beyond a certain stage, these patients are very slow to recover and I suggest that this stage is marked by the failure of the intestinal mucosa to exclude the intestinal toxins from the blood stream.

In the lower intestine bacterial fermentation gives us much the same end products as normal digestion *plus* the specific toxic of the intestinal flora and both end products and specific toxins are very poisonous if they reach the blood stream.

The cells of the mucosa select, absorb, synthesize and pass on to the blood the suitable and exclude the unsuitable material. In ordinary health the intestine swarms with the *Bacillus coli communis* until a great part of the stool is made up of them. Fermentation goes on briskly and diarrhœa must grievously upset their prosperity.

The normal cells wall must therefore have great power of exclusion against their toxins. If anything occurs to upset this selective absorption, the result is serious. A slight experimental injury to a dog's intestinal lining allows these products to pass unchecked with very poisonous effects.

A day's starvation allows the mucosa of the adult to recover. In a breast-fed child the cell's work is hard, but a perfectly balanced food is offered which also contains protective antibodies. In the bottle-fed child the proteins supplied are not in correct proportions. The cells demand lysin and they are given cystine. The fat is different; the action of the

hydrochloride acid and the osmotic pressure are upset by the superabundant salts of cow's milk. Under these conditions the cell is working perilously near to its limit even in health and to it diarrhœa comes as a disaster; for five or six days it may work in spite of irritation and starvation and then it fails and commences to admit the poisons either formed by normal digestion, perverted digestion or of bacterial action.

If the failing cells are many, overwhelming toxæmia and death follow. If, as in the majority of cases the healthy cells can still carry on the fight, it is certain to be a tedious struggle. If we feed, we add fuel to the fire; if we starve, the cell becomes still less efficient. Once the condition I have tried to describe, is established, we must treat it as best we can with the few facts we have to guide us.

Initial starvation need not be stressed; if the child is severely ill, it will vomit and feeding would be cruelty; we must concentrate all our efforts on supplying fluid. Spoon feed with water; forcing it even if it is returned and give intraperitoneal injection of saline solution early before dehydration comes with its toxic vomiting to add to our trouble. Intraperitoneal injections of saline solution in our hands seem safe and constitute in my opinion the one great advance in treatment of recent years. When the vomiting lessens, it is time to decide what food we will use.

It is an obvious and remarkable fact that in most cases the vomiting lessens or ceases with the administration of fluid, whilst the diarrhœa goes on indefinitely. We are then faced with the vexed question of the best initial diet in these cases. Every year gives us fresh theories and every hospital gives us examples of men working side by side advocating different methods. Unless we allow our enthusiasm to outrun our reason, we must conclude that no one artificial food has great advantages over the others. In twenty years I have seen protein, fat and carbohydrate each in their turn blamed for the continuation of the diarrhœa. I have seen carefully balanced "prescription" milk give way to ill-balanced malted or protein "milk."

In 1925 we obtained enough protein milk from America to feed half the babies in the ward for three months. The rest were fed on a high sugar and low protein diet. I changed from one to the other diet suddenly in many cases, but in no case was I able to detect any great change for better or worse in the children. My observations were checked by the Resident Medical Officer and by an experienced sister in charge. The direct dysenteric infections certainly were slightly worse on the protein and the loss of weight in the less severe cases was slower on the protein.

I wish to state clearly that I am quite aware that an ill-balanced diet is likely to lead to diarrhœa and that in many cases this factor may have been of great importance in starting the trouble, but I see no benefit from trying to cure the results of one distortion of diet by another in the opposite direction. A sick child has a right to as evenly balanced a diet as we dare give it. Fat delays digestion and if given in any considerable quantity appears in the stools. There seems a general agreement that the initial food should have a low fat percentage.

There is also a common dread of fresh milk in the acute stages and this in view of the protein milk phase cannot be due to the protein as such. It is milk as a foreign serum with a serological identity that we fear and I believe that it is the damaged mucosa that admits it as a foreign serum unchanged by digestion. Until it is altered by boiling, drying or simmering, it is not safe for use in the acute stages. We require then an initial food containing little fat and about 2% milk protein altered by heat and sugar.

We believe that the sugar seems the least likely to cause trouble in spite of the fact that it ferments easily. The protein also ferments easily, the bacilli revel alike in peptone water or sugar solution. The products of sugar fermentation are less toxic and in our experience no more irritating to the bowel. Our routine is therefore to give a malted milk containing about 1% protein and 6% sugar and after the first acuteness has passed, to add boiled skimmed milk. The rapidity of our advance on to milk varies with the courage and patience of the physician. I believe that the first additions should be by drops, but that, once the desensitization crisis is over, we can advance more rapidly. The addition of lactic acid to the milk is strictly logical and the children take it well. A dried skim milk acidified by lactic acid and brought up to 6% sugar has proved in my hands as satisfactory as the above. There is no excuse for the common error of hunting wildly for some food that will "suit the baby," with our present choice of infant foods a change nearly always means a change only in name and not in composition.

Once over the first acute stage we must feel our way cautiously step by step to the diet of selection which will vary with the season of the year and the age of the child. In summer my choice is freshly boiled milk and water equal parts with sugar added to 6%. In winter the milk may be increased, but in hot weather the extra water is needed and must be given between feeds if not with them. A sick child cannot be deprived of vitamins even for a few weeks and these must be added as a routine.

The vexed question of the best artificial food for babies in hot weather cannot be answered dogmatically. A "humanized" milk is quite impossibly dangerous in Melbourne in hot weather. I am very anxious to admit that this is an insult to our milk supply, but it is a fact and we dare not "stand" milk for any time, nor do I dare to give it unboiled. Strangely enough many who will not admit that the common diarrhœa is an infection, agree with me in this.

The adult carrier of intestinal infections is so common that it is impossible to prevent infection by dirty fingers and dirty bottles; it is madness to add the danger of unboiled milk, unless it is warm from the cow. On the other hand milk that has just been boiled and given as soon as it is cool, although not sterile in the laboratory sense, is in my opinion safe for a healthy baby.

THE EFFECT OF GALVANISM IN THE TREATMENT OF DENERVATED MUSCLE.

By Norman D. Royle, M.D., Ch.M.,
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From time to time articles appear in the medical press advocating galvanism as the treatment for denervated muscles. This is based largely on the supposition that denervated muscles are in a state of inactivity, whereas Langley has shown that the wasting is really due to excessive activity.

That a paralysed muscle recovers under treatment by some form of galvanism is no proof that the recovery is due to the treatment, though this is one of the most frequent assumptions made. A conclusion on this question could be reached if investigation were conducted on a large enough scale, but unfortunately in this country money is not available for such research.

The following is the result of a small research conducted under the Bosch Fund in the Department of Anatomy, University of Sydney, illustrating the effect of treatment by interrupted galvanism upon denervated muscles. The form of current used was that supplied by the ordinary galvanic battery and the treatment was carried out for five days a week over a period of months. Each muscle under treatment was made to contract approximately fifty times during each treatment. The muscles used for testing were the anterior tibial muscles of each hind limb.

In a former paper, "Experimental and Clinical Observations in the Treatment of Flaccid Paralysis" (The Medical Journal of Australia, October 6, 1923, page 35), I have explained why these muscles were chosen and I may state here that that paper should be consulted and read in conjunction with this. The benefit of treatment was estimated by the *post mortem* weights of the group of muscles treated compared with the muscles of the opposite limb which were used as a control. In the normal animal the variation in weight between the two sides is very small, but it may be as great as 5%. These muscles were not splinted, because I found in my former researches that the anterior tibial muscles recovered just as quickly when not splinted on account of the posture assumed by the animal, as when splinted. The following table gives the particulars of this series of experiments. The muscles were denervated by cutting out a section of the common peroneal nerve so that recovery was not possible.

A reference to this table will show that there was very little difference between the weights of the treated and untreated muscles. In one instance both muscles were the same weight and in two instances the untreated muscles were slightly heavier. This indicates as regards wasting the effect of galvanic treatment is negligible. This series also showed that as regards the ability to contract to a galvanic current the treated muscles were in no respect better than the untreated ones.

Acknowledgment.

In carrying out these experiments I had the very able assistance of Miss Leslie Roberts, member of the Australasian Massage Association to whom my thanks are due.

Subject.	Date of Operation.	Date of Commencement of Treatment.	Date of *Post Mortem* Examination.	Weight of Muscles in Grammes.
Rabbit 1	July 19	July 26	November 30	Treated muscle 1·2 Untreated muscle 1·2
Rabbit 2	July 12	July 19	November 30	Treated muscle 1·55 Untreated muscle 1·6
Rabbit 3	July 12	July 19	November 30	Treated muscle 1·55 Untreated muscle 1·6

Reviews.

OSLER'S MEDICINE.

In the first hundred pages of the third volume of the new edition of Osler's "Modern Medicine"[1] the reader will find an admirable introduction to the study of metabolic disorders contributed by Du Bois, whose name is so familiar through his well known formula for ascertaining the body surface.

Dr. Thomas Fletcher in his account of *diabetes mellitus* and *insipidus* fully traverses the evolution of knowledge of these diseases and furnishes a very complete account of the principles of modern treatment.

The article on obesity by James M. Anders is not so satisfying, the writer concerning himself too much with the treatment of the rarer, extreme, crippling degree of the complaint to the neglect of the milder degrees of adiposity for which so many patients seek relief. Speaking of juvenile obesity Dr. Anders tells us of various ways in which one may employ pituitary extracts, including the giving of pituitrin by the mouth. The puzzled reader, probably imbued with the idea that pituitrin taken orally is a more or less useless preparation, would prefer to know of one way, if any, that Dr. Anders recommends and especially would like to know if the commonly adopted method of combining thyreoid extract with whole gland pituitary extract would meet with his approval. We deplore the appearance in a standard work of this kind of so futile a statement as that it is wise to "guard" the heart by combining small doses of digitalis when giving thyreoid extract in the myxœdematoid type of obesity.

The remainder of the volume, some eight hundred pages, is devoted to disorders of the digestive system. In the section on diseases of the œsophagus Chevalier Jackson and Louis H. Clerf stress the value of œsophagoscopy in diagnosis, provided the counterindications against the use of the instrument are remembered. From their viewpoint the blind passage of sounds, coincatchers *et cetera* are crudities of a past age.

Functional disorders of the stomach are fully dealt with by Julius Friedenwald who starts disappointingly with an introduction in which he gives the more or less conflicting views of various authorities, such as Eppinger and Hess, Cannon, Alvarez and others upon the relative share of nervous and muscular disorders in these conditions, but entirely fails to indicate his own views. We regret to find him perpetuating the old custom of classifying and

[1] "Modern Medicine, its Theory and Practice," edited by Sir William Osler, Bart., M.D., F.R.S., Re-edited by Thomas McCrae, M.D., Assisted by Elmer H. Funk, M.D.; Volume III.; Diseases of Metabolism, Diseases of the Digestive System; 1926. Philadelphia: Lea and Febiger; Sydney: Angus and Robertson, Limited. Royal 8vo., pp. 1052, with illustrations. Price: 42s. net.

dealing separately with a long string of gastric neuroses, even to the extent of laying down rules for the treatment of each. We regard as most undesirable this method of discussing each symptom as though it was a distinct disease, when in actual practice one symptom is practically never found alone. It is extremely confusing to students and in our opinion is largely responsible for the fact that these common disorders excite so little intelligent interest in the mind of the average practitioner.

The contribution of Charles F. Martin and Colin Sutherland on organic diseases of the stomach is excellent and would alone give this volume a claim for a space on the book shelves of medical practitioners. It was, however, a surprise to find our old friend nitromuriatic acid appearing again in the treatment of chronic gastritis. We recall that the late A. R. Cushny in his "Text Book of Pharmacology and Therapeutics" writing that the reputation of this preparation "appears to be a survival of the ancient doctrine of signatures, according to which the therapeutic value of a drug was indicated by its colour, shape or other similar qualities; thus, red coloured roots were used for disease of the blood, and yellow fluids, such as nitrohydrochloric acid in jaundice, a yellow disease."

Dr. Alfred Stengel supplies a very useful account of the diseases of the intestines, the pages devoted to intestinal obstruction being particularly good. So much has been written recently upon dilatation of the duodenum, especially the second portion, associated with symptoms of intermittent obstruction, that it is disappointing to find but a very cursory reference to these disorders. It was a surprise to find Dr. Stengel suggesting as useful hypodermic remedies in the collapse of *cholera nostra* tincture of digitalis and digitalone. The use of the tincture in this way was probably a slip, but such slips should not get into the final type and in any case few who base their use of digitalis on physiological principles, would look for good results from its use in this form of collapse.

The editor made a wise choice when he invited Dr. Eugene Opie to discuss the diseases of the pancreas. Dr. Opie whose researches into the pathology of the pancreas have been largely responsible for present day knowledge of the gland, has a very facile pen and has furnished an article that should be read by everyone who aspires to any skill in the diagnosis of abdominal diseases. We note that in the section dealing with acute pancreatitis only the hæmorrhagic, gangrenous and suppurative forms are mentioned. The reader is left with the impression that there is no acute pancreatitis except these desperate forms from which comparatively few recover and these usually seriously incapacitated. There is at least one form of acute pancreatitis, that met with in mumps, which is much less severe and we would have been glad to read Dr. Opie's views about this type and to learn whether he thinks that any other acute infections involve the gland and run a comparatively benign course.

The chapters on "Diseases of the Liver, Gall Bladder and Biliary Ducts" originally compiled by the late A. O. J. Kelly have been revised by B. B. Vincent Lyon, who has incorporated the results of his investigations into the secretions of bile in the various disorders of the liver by means of his method of non-surgical drainage of the gall bladder and bile ducts. It is to be regretted that Dr. Lyon in describing his technique does not give more attention to minor details. Thus in referring to continuous duodenal drainage by which means as much as three and a half to four gallons of bile may be drained away in three weeks, he fails to mention how the syphonage is carried out. Again, it would be helpful to know how he deals with those who find difficulty in tolerating the tube, an important point in view of the fact that in many of the conditions in which the treatment is indicated, nausea and vomiting are frequently prominent symptoms. When we read the long list of diseases that have been relieved by this treatment, we wonder if in the near future the castor oil bottle in the family medicine chest will be replaced by a duodenal tube. Still it is possible that in some of the ailments such as the acute hepatic congestion of the over indulgent tropical dweller, sick headaches, *erythema nodosum et cetera*, the victims will prefer the healing action of time and the old fashioned mercurial pill to going to bed for three weeks with a rubber tube in the duodenum. However, a little over enthusiasm can be readily overlooked in one who has supplied us with a method of investigation and treatment that has already enabled many hitherto obscure diseases of the liver to be satisfactorily dealt with. In writing of cancer of the gall bladder Dr. Lyon offers food for thought to those who would, regardless of symptoms, operate upon all gall stone carriers for fear of this complication. He points out that while statistics seem to indicate that from 5% to 10% of all gall stone carriers operated upon show coincident cancer of the gall bladder, on the other hand (American) statistics show that the operation mortality risk in gall bladder cases is likewise 5% to 10%. Hence the cure would be as bad as the disease or rather worse, as the deaths would occur earlier.

Sir Humphrey Rolleston has supplied a very comprehensive account of the diseases of the peritoneum, running into a hundred pages and has left no loophole for criticism.

AN ATLAS OF ANATOMY.

NOVEL in many respects, "Baillière's Synthetic Anatomy" by J. E. Cheeseman is an interesting attempt to overcome a common difficulty of both the teacher and student of anatomy.[1] It is published in twelve parts, each of which is complete with index and insructions. Three parts only, dealing with arm and shoulder, forearm and hand have yet been completed.

Each part consists of twelve drawings on transparent paper, printed in six colours, with a horizontal and vertical millimetre scale. By superimposing several drawings a composite picture can be obtained of any thickness desired and an idea may be formed of the relations of the part in their three dimensions.

The drawings are naturally somewhat diagrammatic. A critical examination reveals certain inaccuracies and deficiencies. For instance, in the drawings of the forearm the ulnar artery and nerve are shown without any relation at all to the *flexor carpi ulnaris* muscle, the medial and lateral anterior thoracic nerves are poorly and slightly inaccurately represented and the relative size of certain vessels, such as the superficial and deep palmar arches, are not accurately portrayed. Nevertheless in spite of this they appear to be an accurate representation for the most part of the normal anatomy.

The drawings easily lend themselves both to copying and enlarging. It is the author's idea that in this way they will be a valuable adjunct to other methods of learning the subject. Though the value of this method of learning anatomy is a matter of opinion, it is thought that, if taken in conjunction with dissection, these books have some value for the student of anatomy and are also likely to be of value for revision.

MENTAL DISEASE IN ITS EARLY STAGES.

To the general practitioner the early stages of mental disease often bring much anxiety and uncertainty. The difficulty, of determining the mental state of a patient is often considerable. The second of the extra numbers of *The Lancet* is designed to meet this difficulty.[2] This volume is written by authors who can speak with authority. It is divided into three parts, the first deals with symptomatology, the second with classification and the third is labelled "Appendices." Symptoms are discussed as they occur in infants, in children, in adolescents, in adults and in old age. Twenty-three chapters are included under the heading of classification and the appendices include such subjects as occupational therapy, juvenile courts, psychoanalysis and so forth. This volume should find a large sphere of usefulness.

[1] "Baillière's Synthetic Anatomy: A Series of Drawings on Transparent Sheets for Facilitating the Reconstruction of Mental Pictures of the Human Body," by J. E. Cheeseman, Deputy Medical Officer of Health for Leyton, London; 1926. London: Baillière, Tindall and Cox. Price: 2s. 6d. each part.

[2] "Early Mental Disease," by a Group of Well-known Authorities; *The Lancet* Extra Numbers No. 2; 1926. London: Wakley and Son (1912), Limited. Sydney: Angus and Robertson, Limited. Imp. 8vo., pp. 200. Price: 12s. net.

The Medical Journal of Australia

SATURDAY, MARCH 19, 1927.

Unqualified Nurses.

THE GENERAL MEDICAL COUNCIL has for several years called the attention of members of the medical profession to the provision contained in the *Midwives Act*, 1902 and the corresponding acts in Scotland and Ireland to the effect that "no woman shall habitually and for gain attend women in childbirth otherwise than under the direction of a qualified medical practitioner, unless she be certified under this Act." The Council is informed that some medical practitioners assist uncertified women to attend women in childbirth contrary to the law. The statute has been introduced for the protection of mothers and their infants. If a medical practitioner by the issue of certificates or in any other manner enables an uncertified woman to attend women in childbirth without supervising her work, he renders himself liable to deregistration. His conduct is said to be discreditable to the profession of medicine and calculated to defeat the purpose of the statute. The General Medical Council deals in this notice with an extreme offence. The medical practitioner in the circumstances would be guilty of aiding and abetting a woman to break a law. The wording of the provision is a little unfortunate, for it might be inferred that a medical practitioner is acting in the best interests of his patients and of the community if he accepts the services of an unregistered midwife or maternity nurse to assist him in his attendance on his parturient patient. Moreover, if there were no objection to the employment of an untrained or unregistered midwife to act under the direction of the attending obstetrician, it might be held that there would be no objection to the employment of an untrained or unregistered woman to act as nurse under the direction of a surgeon, physician or general practitioner.

The science and art of nursing has developed rapidly during the seventy years since Florence Nightingale started her revolution. There is as much difference between the homely, untrained woman and the trained hospital nurse as there is between the charlatanry of the herbalist and the work of the registered medical practitioner. The public has learned to recognize that the long technical education of the medical student forms a safeguard of the public interests, a guarantee that the practitioner of medicine of modern times is equipped with the accumulated knowledge of the past and the present. The law forbids anyone other than a trained and registered medical practitioner to hold any public medical appointment. Medical practitioners who collaborate with or cover untrained and unregistered practitioners, render themselves liable to have their names removed from the medical register. The British Medical Association zealously guards the honour and dignity of the medical profession and forbids its members to have professional dealings with unregistered or irregular practitioners. In a similar manner the organizations representative of the nursing profession will not countenance any collaboration with untrained women, either in the field of general or obstetric nursing or in the sphere of midwifery. In those States in which State registration of nurses obtains, the unregistered woman is deprived of the rights and privileges granted to registered nurses. She is a charlatan, just as the untrained practitioner of medicine or quack healer is a charlatan.

The Australasian Trained Nurses' Association and the Royal Victorian Trained Nurses' Association have cause for complaint against the medical profession. Many medical practitioners who would flout the idea of extending professional recognition to an unregistered, amateur doctor, carelessly work together with women who are neither trained nurses nor registered under an act in virtue of having acted as nurse or midwife for years before the measure became law. It is not suggested that this action on the part of medical practitioners is more than thoughtless. It does not occur to them that the same objections obtain to this practice as obtain to the practice of employing or working with an untrained assistant or practitioner. The General Medical Council has not issued a warning against the practice. Yet a moment's

thought must reveal that the chances of recovery of a patient or the prospects of an uneventful normal parturition and puerperium are greatly enhanced if both the doctor and the nurse in attendance are highly trained and efficient. A careless or unskilled nurse may render the aid of the best practitioner of medicine of no avail. By training and study the modern nurse acquires knowledge and skill and by discipline she learns the value of faithful observance of the doctor's instructions. No one but a highly trained nurse can discharge the duties in a satisfactory manner.

The medical profession lends its aid to the training of probationers and student nurses. What would be the sense of the expenditure of all this energy if the training were a thing of no moment? If members of the medical profession would determine to refuse to accept any responsibility for the welfare of patients unless the nurses in attendance were trained and registered either by law or by the representative nursing organization and decline to act with an untrained woman, they would at once raise the status of the nursing profession. The public interest is at stake. Much damage may be done by the careless action of medical practitioners.

Current Comment.

PANCREATITIS.

In last week's issue of this journal there appeared an abstract of an article by Mr. Digby Chamberlain, of Leeds, on the subject of acute pancreatitis. Mr. Chamberlain discussed the pathology and gave reasons for his acceptance of the view that pancreatitis is the result of infection of the gall bladder caused by a hæmolytic streptococcus and that infection travels to the pancreas by way of the lymphatics. He holds that regurgitation of bile along the pancreatic duct is prevented by a valve which guards its opening. In discussing the possible sources of infection Mr. Chamberlain pointed to regurgitation of infected bile into the pancreas, lymphatic infection of the pancreas from the gall bladder, infection from an inflamed common bile duct and infection from elsewhere. His reasons for accepting the lymphatic method of infection may be stated in a few words. In four cases of acute pancreatitis he found a hæmolytic streptococcus in the bile and in one of the cases obvious disease of the gall bladder was present. Maugeret has shown that inflammation of the common duct is not present in acute pancreatitis. Deaver and Maugeret have shown that close anatomical connexions exist between the lymphatics of the gall bladder and those of the pancreas. Mr. Chamberlain discovered a fold at the exit of the pancreatic duct which he believed acted as a valve and would prevent regurgitation. At the same time he found among the one hundred specimens studied one normal one in which bile staining of the pancreatic duct was present. He pointed out that bile may regurgitate, but added that if the bile is healthy, it will not cause an acute pancreatitis. It will be seen at once that there are many vulnerable spots in Mr. Chamberlain's armour. Before discussing the subject, however, it is well to draw attention to the work of Dr. Mark Kaufmann, who rejects the view of the lymphatic spread as a result of his experimental studies.[1]

Dr. Kaufmann first of all undertook a repetition of the experiments of Graham and Peterman, who claimed to produce a pancreatic lymphangitis. In every instance he found a pancreatic lesion similar to that described by Graham and Peterman after the injection of *Staphylococcus aureus* cultures in the portal veins of cats. He found identical lesions, however, in other organs, such as spleen, kidney, heart muscle and lungs. He concluded that he was dealing with a generalized bacteriæmia and this was further evidenced by the recovery of the organism in pure culture from four animals. In four cats Dr. Kaufmann made an attempt to infect the lymphatic gland which lies on the surface of the pancreas at the junction of the head and body of the organ. Staphylococci were injected under the gland capsule. An acute inflammatory lesion was found in the gland in each instance. Blood culture yielded the causative organism. In one cat an abscess formed under the gland and invaded the pancreas by contiguity, but apart from this no lesion of the pancreas resulted beyond slight œdema and congestion. In four instances staphylococci were injected under Glissan's capsule of the right lobe of the liver. Organisms were recovered by blood culture in one cat, abscesses were found in the liver and an abscess lying in the curve of the duodenum between the duodenal wall and the pancreas invaded the wall of the latter for a distance of about six millimetres. The change was localized and sections of the remainder of the organ manifested nothing beyond engorgement of vessels and leucocytosis. In the other three animals no pancreatic change was found. In a group of thirteen animals lesions of the gall bladder were produced. In three the hepatic artery and cystic duct were ligatured and staphylococci were injected under the serosa of the gall bladder; in four the organisms were injected into the peritoneal coat of the gall bladder and in six the hepatic artery and cystic duct were ligatured and the organisms were injected under the peritoneal coat of the gall bladder. In the cat the lymphatics of the gall bladder and of the biliary ducts drain into the hepatic chain of glands. Inflammatory change was found in all,

[1] *Surgery, Gynecology and Obstetrics*, January, 1927.

indicating that inflammation was passing from the gall bladder by way of the lymphatics. The organism was recovered in pure culture from glands of this chain in two instances in which a culture was taken. Examination of the pancreas of six animals on whom the autopsy was performed within seven days of the operation, revealed no change, gross or microscopical. In three out of four animals on whom an autopsy was performed in from ten to fourteen days, a change was noted in the tissue examined. In two the changes consisted of an infiltration of small round cells in the form of bands into the interlobular tissue. At one or two points these bands penetrated the parenchyma. There was no evidence of fixed tissue proliferation, no polymorphonuclear cells, no red blood cells or any of the evidence of acute inflammation or of any damage to the pancreatic tissue. In all sections vessels were engorged and manifested a mild leucocytosis. In one instance an area of acute inflammation was found under a broken down lymph gland. In discussing these two cases Dr. Kaufmann reports that sections were examined by other observers as well as by himself and that the consensus of opinion was that the round celled infiltration was not inflammatory and was normal to the animal. If it had been due to an inflammatory irritant, Dr. Kaufmann would have expected to find more invasion with some damage to the parenchyma. "The condition was too patchy and irregular in its distribution." The conclusions in regard to these two cases may be at least regarded as open to question; but ten to fourteen days had elapsed between operation and autopsy and some extension of the bands of small round cells into the parenchyma had occurred. In three of the thirteen experiments the condition had lasted for about two and a half months. The picture at autopsy was that of chronic cholecystitis. Definite productive change was present in the gall bladder. In the pancreas there was no evidence of inflammatory change, the parenchyma manifested no sign of injury, but there appeared to be a slight thickening about the walls of the pancreatic ducts.

In discussing the whole question Dr. Kaufmann admits the existence of a lymphatic pathway from the gall bladder, but holds that there is no evidence that infection can follow this pathway. The anastomosis of lymphatics occurs outside the pancreas and by the time the vessels have left the pancreas they have arrived at the collecting trunk stage and have not only valves, but a definite muscular structure. For any damming back to occur it would be necessary for the valvular action to fail and for the muscular action of the tubes to be inhibited. He refers to Deaver's claim that under pathological conditions the valvular action of the pancreatic lymphatics would be eliminated, as an assertion based on no definite proof. He quotes Bartel's reference to the competency of the valves of the pancreatic lymphatics in explanation of his failure to inject pancreatic lymphatics from the duodenum.

It is probably safe to conclude that all pancreatitis depends ultimately on bacterial infection. The question under dispute is the manner in which the bacteria or their products are introduced to the gland. There are four possible ways, the blood stream, the lymphatic channels, the pancreatic ducts, direct extension from neighbouring organs. The last named method may be excluded. On the one hand there are observers such as Deaver, Maugeret and Chamberlain holding fast to the lymphatic extension view and on the other hand Kaufmann as strongly denies that it is possible. It must be remembered that Kaufmann has introduced virulent organisms into the bodies of healthy animals; these are not comparable to the bodies of human beings, for it is more than likely that there exist many predisposing influences which may alter even the muscular action of the walls of lymphatics. Deaver has suggested that under pathological conditions the normal function may be completely altered. This is admittedly speculative, but the point is that animal experiments should not be necessarily accepted as indicating what happens in the human subject. Mr. Chamberlain accepts the lymphatic view partly as a result of his scanty observation and partly as a result what has been suggested by the findings of others. Neither of these two observers has devoted much consideration to the question of blood borne infection. It must be remembered that occurrence of retrograde infection along the pancreatic duct has been definitely proved. It is not unlikely that Waring and Griffiths (see THE MEDICAL JOURNAL OF AUSTRALIA, April 5, 1924) were right when they claimed that any infection may travel along one of the different routes.

MEDICAL ADVICE TO SHIPS AT SEA.

WITH the installation of wireless apparatus on deep sea vessels the anxieties of masters have to a certain extent been lessened in regard to emergency illness. They have been able to communicate with medical practitioners ashore or with doctors of passenger ships. According to Henri F. Schaeffer the liaison between ships and shore was first effected as a result of the efforts of the Seaman's Church Institute in the United States. Schaeffer who is Port Sanitary Officer at Le Havre, points out that the importance of these medical consultations has been recognized by the French Government and that France has been obliged to place an organization for medical consultation at the disposal of a large number of ships passing along its coasts. The services of the organization in America, Norway, Sweden and France are placed free of charge at the disposal of all ships under whatever flags they may be sailing. Schaeffer raises one point which is most important. The standardization of medicine chests in all countries is essential. He suggests that some international organization, such as the League of Red Cross Societies should initiate a universal scheme. The Commonwealth should be interested in such a movement.

[1] *The World's Health*, September, 1926.

Abstracts from Current Medical Literature.

GYNÆCOLOGY AND OBSTETRICS.

The Fate of the Graafian Follicle in the Human Ovary.

WILFRED SHAW (*Journal of Obstetrics and Gynæcology of the British Empire*, Winter Number, 1925) in his investigations into the histology and physiology of the human ovary, concludes, in regard to the Graafian follicle that only a small percentage of the Graafian follicles found in the ovary at birth undergo ovulation. The majority become atretic. The large lutein cells of the *corpus luteum* are derived from the granulosa layer of the follicles. The paralutein cells develope from the *theca interna* layer. About eight months are required for a *corpus luteum* to become converted into a *corpus albicans*. Numerous forms of atretic structures are derived from the Graafian follicles. They are, the *corpus atreticum*, the *corpus caudicans*, the *corpus fibrosum* and the *corpus restiforme*.

Post Mortem Findings in Puerperal Sepsis.

J. HALBAN (*Wiener Medizinische Wochenschrift*, September 4, 1926) presents the *post mortem* findings in one hundred and sixty-three cases of puerperal sepsis. In eighty-two instances hæmolytic streptococci were found in the blood. Peritonitis was noted in twenty and metastases especially in the lungs occurred in twenty-four. Lymphatic spread of infection was present in twenty-nine cases. Extensive thrombosis contraindicating operation was seen in three, whilst in a similar number less widespread thrombosis was found. In all these seventy-nine cases the conditions were unsuitable for ligation of the thrombosed veins. In three cases operation could have been performed, but the exact extent of the thrombosis could not be determined prior to death. Rigors occurred in half the number of eighty-one patients without thrombosis, 25% only had rigors. Pulmonary abscess occurred in every second patient among eighty-two with hæmatogenous infection as compared with every ninth patient with lymphatic spread. The author considers that owing to the difficulty of diagnosis ligation was impracticable.

Causation and Treatment of Uterine Hæmorrhage.

L. ADLER (*Wiener Medizinische Wochenschrift*, October 23, 1926) states that any disturbance of the ovarian cycle is closely associated with alterations in that of the uterus. The ovary is an organ of internal secretion and as such is in close association with the other endocrine glands. Diseases of the latter, such as goitre and Addison's disease, affect the menstrual cycle. The vasomotor centre in the subthalamic area is also closely associated with the ovary and the effect of fright and anxiety in the causation of abnormal uterine hæmorrhage has been noted. The uterine musculature normally reacts to the ovarian stimulus and if myomata or hypoplasia be present, the contractions are weak and irregular and menstruation is accordingly affected. Hyperæmia of the pelvic organs also plays a part in the amount and duration of the hæmorrhage. Assuming these factors to be correct the hyperæmia associated with salpingitis causes increased hæmorrhage, although the duration is not altered, unless the ovary is also involved in the inflammatory process. The situation of any myomata is of the utmost importance; the worst cases of hæmorrhage are associated with submucous fibroids or polypi. No treatment is required in the absence of symptoms. Radiotherapy should be reserved for patients at the menopause and for patients in whom there is no suspicion of malignant disease. Operation is indicated for malignant disease, inflammatory changes in the adnexa and for most tumours. Hæmorrhage at puberty is usually connected with hypoplasia not only of the ovary, but also of other organs. If general hygienic measures, tonics *et cetera* fail, *corpus luteum* and pituitary extracts should be used. Blood transfusion may be required for severe hæmorrhages. Curettage of the uterus is useless in the majority of cases and has frequently to be repeated. The author is strongly opposed to the use of X rays for temporary sterilization. On the other hand, radiotherapy is the correct treatment for hæmorrhage at the climacteric, provided malignant disease has been excluded. The presence of hæmorrhage not related to menstruation requires the exclusion of possible pregnancy, intra- or extrauterine. If this be done, erosion of the cervix, cervical polypi and epithelioma must be sought for and treated by operation followed in cases of malignant disease by intensive radiation. Treatment of any uterine hæmorrhage must be individual and no palliative treatment should be commenced unless malignant disease has been completely excluded.

Treatment of Salpingitis and Perimetritis.

L. BODNAR (*Wiener Medizinische Wochenschrift*, October 16, 1926) maintains that iodine has a beneficial effect on chronic inflammatory conditions of the tubes and pelvic peritoneum. He uses a tampon impregnated with the following solution: Iodine 0·1 gramme, potassium iodide 0·1 gramme, cacao butter 3·0 grammes. The vehicle for the iodine is of importance; glycerine is absorbed too slowly, cacao butter is better, while suspension in watery or oily solutions, such as olive oil, is probably the best. The application is made twice a week followed by douches the next day. To prevent irritation of the vagina and vulva by the discharge induced the author advises smearing the vaginal walls with a bland ointment. There is rapid decrease in the size of all tumours, mobility of the uterus is soon attained and the general health is greatly improved. No bad effects except vulvar irritation have been noted. This method is best employed in association with diathermy or hot air. The contraindications are acute salpingitis, definite pelvic peritonitis and gonorrhœal infections responding to bacteriological tests.

Postoperative Retention of Urine.

H. KÜSTNER (*Deutsche Medizinische Wochenshrift*, October 8, 1926) refers to the frequency of urinary retention especially following gynæcological plastic operations. He has had good results from the use of "Urotropine." This is not given as a prophylactic, but sufficient time is allowed to permit attempts at normal micturition. If urine has not been passed by the evening of the operation, five cubic centimetres of a 40% solution of "Urotropine" are injected intravenously. This method was successful in thirty-four cases in a series of thirty-six. One injection was sufficient for twenty-nine and a second dose was necessary with five patients. Two patients required catheterization owing to severe pain. Urine is generally passed shortly after the injection or occasionally several hours later. No bad after effects were noted.

Streptococcal Virulence in Puerperal Infections.

G. E. HADJIDAKIS (*Wiener Medizinische Wochenschrift*, October 16, 1926) refers to attempts made to determine the virulence of streptococci as a guide to the prognosis in puerperal infections. In particular he has tested the method of Ruge. In this method 0·5 cubic centimetre of blood is aspirated from the arm into a sterile tube and shaken for five minutes until defibrination occurs. This is then mixed with vaginal secretion, placed on a sterile slide and coverslip and sealed. The slide is kept at 37° C. for three hours and then inspected under dark field illumination. If the vaginal streptococci have increased in numbers, the virulence is high and the prognosis grave. If no increase has occurred or if increase takes four hours or longer, then a low grade of virulence is present. The method was tried in seventy cases—forty-three of abortion, twelve of puerperal sepsis, eleven of salpingitis, two of ectopic pregnancy, one of abscess of the pouch of Douglas and one of ovarian cyst. Streptococci were present in eighteen cases—thirteen of abortion, three of puerperal conditions, one of abscess and one of ovarian cyst. A response to Ruge's test was obtained in six of eighteen cases, in two the reaction was doubtful and in ten no increase occurred. No deaths occurred among the five patients suffering from abortion, but in only one did the clinical course correspond to the grave prognosis anticipated by the reaction. The remaining four patients left hospital after a normal convalescence. A reaction in a case of puerperal infection was associated with

thrombophlebitis of both legs. The only fatal case in the series was one in which no reaction was obtained. Despite these results the author considers that the test is of considerable value.

NEUROLOGY.

Amyotrophic Lateral Sclerosis.

G. MARINESCO (*Revue Neurologique*, November, 1925) writes a long paper to show that the histological changes in amyotrophic lateral sclerosis are essentially the outcome of chemical disturbances, represented by the activity of intracellular ferments affecting colloidal media. He asserts that the ultramicroscope reveals intracellular particles in fluid suspension which are colloidal in nature, hence justifying definition of the nerve cell as a colloidal complex. Further, ultramicroscopy aided by intravital staining indicates that each variety of cell has its own colloidal structure, adapted to function and related with its acido-basic reactions. Moreover, in the cytoplasm of all cells there is a diastasic mechanism, having two objectives, one of catalysis depending on the presence of iron and manganese, the other of oxidation depending on colloid particles. As to which cells are primarily affected in amyotrophic lateral sclerosis Marinesco is satisfied that they are the giant cells of the precentral cortex, as has been shown by others. Lastly, he thinks that the responsible pathogenic agent is introduced from without, but hitherto it has defied identification. All that is certain is that it is neither syphilitic nor tuberculous in origin.

Idiopathic Narcolepsy: A Disease Sui Generis.

W. J. ADIE (*Brain*, September, 1926) has described twenty cases of a disease named narcolepsy, after Gelineau and characterized by the occurrence in the same patient of two kinds of sudden attack. In one there arose a causeless, irresistible inclination to sleep; in the other as the result of some emotional disturbance the muscles became limp and powerless, so that the victim sank to the ground conscious, but unable to move. At times the postemotional attack ended in sleep. Many attacks were transitional between one form and the other. Both sexes were affected. The disease began most frequently in adolescence and rarely later than the fortieth year. Apart from these attacks and possible pituitary disorder the individuals appeared to be healthy. The frequency of the attacks varied from two or three a day to one every few minutes, the duration from a few seconds to several hours, the depth of the sleep from light to profound. The author holds that the attack, being inevitable, might endanger life; the condition in the attack coincided in every particular with that of normal sleep. Any emotion, pleasurable or the reverse, may precipitate the second kind of attack; hearty laughter is the most potent cause. None of these patients have become epileptic or affected by any organic disease to which the attacks could be attributed. Rest relieved the symptoms, but no other form of treatment influenced them favourably nor has recovery been observed. Sleep attacks indistinguishable from those of true narcolepsy occur in many diseases, but (apart from two cases mentioned here of narcolepsy after *encephalitis lethargica*) the combination of sleep attacks with attacks on emotion occur in no other condition whatsoever. The conclusion is that Gelineau's narcolepsy is a disease *sui generis*, not very rare, commonly mistaken for epilepsy or hysteria though distinct from both. It is a functional disorder of the nervous system, probably an undue fatiguability of nerve cells in individuals with a peculiar kind of nervous activity that allows excessive responses to emotional stimuli and favours the spread of inhibitions. Possibly it results primarily from a disorder of the pituitary body and adjacent centres.

Familial Claw Foot with Absent Tendon Jerks.

C. P. SYMONDS AND M. E. SHAW (*Brain*, September, 1926) state that Roussy and Levy have recently reported the occurrence in seven members of one family of acquired bilateral *pes cavus*, together with total abolition of the tendon jerks and in some cases atrophic weakness of the hands. This, they claim, is a clinical picture hitherto undescribed, to be regarded as distinct on the one hand from Friedreich's disease and on the other hand from the so-called peroneal type of progressive muscular atrophy originally described by Charcot and Marie and Tooth. The authors record details of a similar family for comparison with Roussy and Levy's case and adduce evidence for supposing that both families represented *formes frustes* of the Charcot-Marie-Tooth disease. An instance is also recorded from another family of the *forme fruste* and the fully developed disease occurring side by side in two sisters.

Cerebral Disorders after Wounds of the Cervical Sympathetic.

VINCENZO NERI (*Revue Neurologique*, April, 1926) draws attention to various cerebral disorders which he has observed in nine cases of war wound of the cervical sympathetic. In the first place, as an immediate effect, there was a strikingly severe general disturbance, approaching that seen in cases of head wound and consisting of loss of consciousness or restless delirium. On recovering consciousness there was complaint of intense headache, usually homolateral and described as pulsating and along with this there were photophobia and giddiness. After several weeks the headache and the visual and labyrinthine disturbances seemed to become less acute, but there were paroxysmal and severe recurrences. In several cases epileptiform attacks with and without loss of consciousness occurred. The mental state also was changed and in an interesting manner. There was resemblance to neurasthenia in complaint of loss of mental and physical vigour, loss of insight and emotional control, increased irritability and unfitness for occupation requiring sustained attention. Even seven years after being wounded one officer said that he still experienced "a painful sensation of arrested mental faculties, dulness of memory and idea-association and a lasting headache after mental work." In addition to the foregoing these subjects always showed the well known physical sign originally described by Claude Bernard as resulting from section of the cervical sympathetic and to be explained by interruption of vasomotor paths to the head. The conclusion is that the man with a wound of his cervical sympathetic became the sufferer from a permanent, morbid, cerebral condition, a condition comparable with that of the man with the head wound, described by Lasègue in the words "he has lost his cerebral virginity."

Syringomyelia with Nerve Root Cavities.

JOHN D. COMRIE AND J. W. DAWSON (*Edinburgh Medical Journal*, September, 1926) record in detail and with clear illustrations a case of syringomyelia. It was characterized by typical cervico-dorsal cord changes and extraordinary cavities in the seventh to the tenth dorsal nerve roots on the left side. Clinically the patient, aged fifty-one years, had led an active life until seven months before death when symptoms arose compelling a diagnosis of *tabes dorsalis*. The cavitation was referred to the parallel development of syphilitic disease of meninges and blood vessels.

Insanity in Japan.

KOICHI MIYAKE (*Japanese Journal of Neurology and Psychiatry*, July, 1926) reports that in the year 1924 there were 9,608 insane inmates of hospitals in Japan, the ratio to the sane population being approximately one to 6,000. Classified according to Kraepelin's nomenclature the percentages worked out as follows: (i.) Symptomatic and infectious psychoses 1·31%, (ii.) syphilitic psychoses 27·21%, (iii.) toxic psychoses 1·74%, (iv.) senile psychoses 1·62%, (v.) endogenous psychoses (*dementia præcox*, epileptic insanity *et cetera*) 51·15%, (vi.) constitutional psychoses (hysteria, manic-depressive insanity, *et cetera*) 16·68%. With the exception of "imbacco," a form of hysteria with echo-symptoms and affecting the Aino race in Hokkiado, there is no psychosis peculiar to the Japanese and there is no "running amok." Further, although there is a large consumption of "sake" (said to contain 14—18% of alcohol), cases of alcoholic insanity are rare and lastly there is less hysteria than among western nations.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THP SECTION OF SURGERY OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on October 20, 1926, MR. E. T. THRING in the chair.

Suppurative Arthritis of the Knee Joint.

MR. BALCOMBE QUICK, D.S.O., read a paper entitled: "Suppurative Arthritis of the Knee Joint" (see page 391).

MR. E. T. THRING said that he had had experience of three cases and that all had been followed by movement. He had found that early cases did very well. His method was to flush the joint with a weak antiseptic followed by saline solution. Tubes introduced into the joint were always followed by adhesions; they should be left just inside the capsule.

MR. LENNOX TEECE said that it was necessary to remember who was going to treat these patients. They would be treated mainly outside the general hospitals. Very free drainage was essential after acute suppuration had been established. The choice lay between combined anterior and posterior arthrotomy and transverse arthrotomy; the latter was not difficult to do, but the posterior incisions needed a good knowledge of anatomy. Transverse arthrotomy was a good operation and cases cleared up well after it. He had been anxious to meet anyone who had had personal experience of Willem's method and was disappointed that Mr. Quick had not been able to tell them about it. It was opposed to all recognized authorities and seemed surgically unsound. He had seen many late results of excision and they were all extremely bad, much shortening was present and not one had any bony union.

DR. R. B. WADE said his experience was mainly confined to children and he found that they differed greatly from adults and especially from infections following war wounds. The outlook as regards loss of life was not grave, the patients who died were those who had septicæmia or pyæmia or in whom drainage had been incomplete. Aspiration resulted in recovery in many cases without the use of antiseptics. Drainage of the anterior chamber sufficed in many cases. The transverse incision was very useful in severe cases in which necrosis of cartilage and bone was found on opening the joint. Ankylosis was almost certain in these cases. There was difficulty in preventing subluxation backwards of the tibia from shortening of the hamstring muscles; the same trouble was found in any knee that was becoming ankylosed, due to the hamstrings overpowering the quadriceps and this might occur even after ankylosis seemed complete. He found Willem's method quite impossible after trying it in older children. Weight extension was useful and resulted in some cases in some mobility.

DR. ST. J. W. DANSEY said he had seen two cases lately of suppurative prepatellar bursitis with the wrong diagnosis. In one case the abscess had been opened by parapatellar incisions. He had found that aspiration and injection were sufficient in some cases. He had tried Willem's method, but found it quite impossible; the patients objected strenuously on account of the severe pain which was caused.

He had seen three cases due to gonococci; the condition had subsided after parapatellar incisions, but resulted in ankylosis. His plan was to make two anterior incisions at first possibly after one or two aspirations and to make lateral incisions later if necessary. He considered the transverse incision saved amputation in many cases.

DR. GEORGE BELL, O.B.E., said he had had an opportunity of seeing several patients in France who had been operated by Blake. He used free lateral incisions without tube drainage with good results. He had tried Willem's method in one case and found it impossible; the patient suffered from much pain and would not move the knee. He remembered seeing Dr. Chisholm use the transverse incision many years previously. He found that cases varied a great deal, but in all early drainage was necessary; in late cases the pus might track a long way upwards or downwards while aspiration was being used. He had seen some patients do well from anterior drainage alone. He had had some experience of excision in the Boulogne area, but was not impressed by it, as the patients all had a bad time after operation.

DR. D. J. GLISSAN pointed out that the ultimate test of success was good function which meant that the knee would carry the body weight efficiently and painlessly and allow sitting without difficulty. How far short of this did the ankylosed knee fall? The patients could walk well, but were rather awkward in sitting. On the whole the ankylosed knee gave satisfactory function in contrast to ankylosed hip or ankle joint which caused a lot of disability. The best position for ankylosis was in a few degrees of flexion; an absolutely straight knee caused the weight to be carried on the heel and did not allow much use of the anterior part of the foot.

DR. HOWARD BULLOCK said that he had come to the meeting to learn and had learned that it did not pay to be timid. He asked Mr. Quick what methods he had used to get his good results and what position he considered best for ankylosis.

DR. P. FIASCHI, O.B.E., asked what methods could be adopted to prevent suppuration in punctured wounds of the knee joint. In dealing with gonococcal arthritis he had used and could recommend "Sulpharsenol" which was almost a specific.

Mr. Quick in reply thanked the various speakers for the kind reception given to the paper. He expressed agreement with Mr. Thring that in all probability, after excluding those with bone injury, the type of case met with in civil surgery was somewhat less serious than those in war work.

He congratulated Mr. Thring on the results obtained in the three cases in which with streptococcal infection recovery with mobility followed opening and lavage and wished to emphasize that there was an extraordinary variation in the virulence of these infections and their prognosis. With regard to needling of the joint for diagnostic purposes (as also in regard to aspiration) he suggested that this was always better carried out through the outer side of the anterior compartment. There was more risk of spread of infection in the soft parts when the fleshy *vastus internus* was punctured than there was if the needle penetrated the expansion of the *vastus externus* which was entirely fibrous. That this was a real risk, was borne out by Dr. Bell who had mentioned a case in which widespread infection of the anterior aspect of the thigh followed repeated joint puncture.

Of vaccine treatment the speaker had no personal experience in such cases. On general grounds, however, he was not inclined to place a high value upon its utility.

Mr. Quick was quite in agreement with Mr. Teece that as transverse arthrotomy was an easier operation to perform than posterior arthrotomy, it was possibly one better suited to the surgeon whose memory of the anatomy of the popliteal space had become somewhat hazy. It should be remembered, however, that the after treatment was much more difficult, besides demanding very constant care and a good deal of time. One advantage of the operation of antero-lateral arthrotomy was that after treatment was carried out in the extended position and this operation was by no means difficult. He also agreed that parapatellar incision appeared to be that most commonly adopted in the first instance. He was exceedingly interested to hear of Mr. Teece's personal experience that non-union commonly followed excision for suppurative arthritis. It was, of course, not always fair to condemn the operation on the grounds of excessive shortening alone, as one could not know what were the original needs of the case due to coexisting bone injury.

He agreed with Dr. Wade that in the majority of instances pyæmic joints in children did well, the others dying from the general infection rather than from the arthritis. He had purposely excluded such cases from consideration as being atypical. They undoubtedly often responded well to aspiration.

Replying to a question asked by both Dr. Wade and Dr. Fisher, he had not experienced any difficulty in subsequently securing extension of the knee. For this reason he had never found it necessary to divide the crucial ligaments at the primary operation, although this would certainly secure nearly another inch of separation of the bones. He believed that the real cause of any such difficulty was insufficiently free division of the lateral ligaments posteriorly.

Mr. Quick was glad to find Dr. Glissan stressing the point that function, namely, mobility, was a secondary consideration, not only relatively where risk to life had to be considered, but that as an absolute disability a stiff knee was less disabling than a stiff ankle or hip joint. There was comparatively little interference with the ordinary amenities of life. Ankylosis with a few degrees of flexion was certainly to be preferred to the absolutely straight leg, but much longer fixation and supervision were necessary when some flexion was given, lest subsequently a slow increase in the angle should occur. Dr. Bullock had also drawn attention to the advantage of slight flexion.

In reply to Dr. Fiaschi he said that the gonococcal joint was also a pyæmic manifestation in which aspiration and lavage were most successful measures. The treatment of a joint wound was by excision of the edges of the wound, both of the overlying soft parts and in the synovial membrane itself. If carried out within a few hours of infliction complete suture might follow, possibly after "bipping." If a longer period had elapsed suture of the synovial membrane alone might be wiser. No suturing of skin or muscle should be done if parts could be approximated only under tension.

He was very interested to find that Dr. Bell, as well as other speakers who had attempted to carry Willem's method out, had had to abandon it. It would seem that the demands on both patient and surgeon were overwhelmingly great. He quite agreed that early drainage was the part of wisdom.

A MEETING OF THE GYNÆCOLOGICAL AND OBSTETRICAL SECTION OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on November 25, 1926.

Radium Treatment.

DR. COLIN MACDONALD read a paper entitled: "Principles Underlying Treatment by Radium" (see page 398).

DR. W. P. SALTAU read a paper entitled: "Survey of Radium Treatment at Women's Hospital" (see page 403).

DR. C. E. DENNIS congratulated Dr. Macdonald and Dr. Saltau on the work they had done and on the trouble they had taken to get into touch with the various patients. He was fortunate in having such keen and able collaborators. The statistics compared on the whole very favourably with those of other radium clinics, especially when the class of patients treated was considered. All of the patients with one or two exceptions had suffered from tumours which were hopelessly inoperable. In fact one patient who was sent to the hospital for treatment, but whom Dr. Dennis had considered too ill for treatment, died a few days later. This was the only instance in which treatment had been refused. Dr. Dennis held that even in the worst cases a palliation of the condition justified the use of radium.

No definite improvement had resulted from increasing the dosage from thirty to forty hours. He did not believe in massive doses on account of the reaction on the health of the patient, the danger of increasing the discomfort and the suffering. Smaller doses, on the other hand, appeared to improve the health and almost always appeared to relieve symptoms for a longer or shorter time. There was also less danger with smaller doses of causing massive necrosis when the growth had invaded the walls of the bladder and rectum and of causing fistulæ with their disturbing sequelæ. The aim had been to relieve distress and suffering mainly with the possibility of cure in view, but he looked on aggravation of symptoms in any case as a retrograde step in a disease associated with such terrible suffering. He preferred not to apply radium to patients with pronounced renal disease, but if it were used the dose should be reduced in order to avoid throwing into the circulation more toxin than the kidney could elminiate.

Dr. Dennis referred to two patients who had died some time after treatment, one from postoperative shock after hysterectomy and the other from some condition unconnected with the carcinomatous tumour. The patients had died at the Melbourne Hospital and sections of the uteri manifested no signs of carcinomata, although according to the pathological report carcinomata had been present prior to treatment. Dr. Dennis then discussed the treatment adopted three weeks after hysterectomy when the wounds from the operation had healed and he said that surgeons who had performed hysterectomy after preliminary treatment with radium had not recorded any increased operative difficulty as a result of the treatment. No patients had been reported as having acquired malignant disease of the ovaries after radium treatment. In conclusion Dr. Dennis said that he hoped that better results would be obtained in future from the combined use of X rays and radium.

The hospital was about to instal a complete X ray outfit. It was his experience in private practice that best results were obtained when this method was used.

DR. H. FLECKER congratulated Dr. Macdonald and Dr. Saltau on their addresses. He was particularly interested in the *résumé* showing the great variations of radium treatment adopted by the leading clinics abroad. The absence of any reference to the German school was particularly noticeable. Nevertheless, most excellent results had been obtained in the treatment of carcinoma of the *cervix uteri* by deep X ray therapy alone, more particularly by Wintz and Seitz at Erlangen who had treated many thousands of patients.

At the Austin Hospital it was possible at all times to follow up patients with carcinoma of the uterus who had been treated elsewhere. Upon examination it was possible sometimes to note an apparently normal mucous membrane of the vagina with no trace of any active focus or infiltration in the remains of the cervix or adnexa even where the *portio vaginalis* had disappeared and even in the presence of fistulæ. In fact it was difficult to understand why the patients had been sent to the Austin Hospital as they were so well.

Dr. Flecker then showed specimens of carnotite (potassium uranyl vanadate) from Radium Hill, South Australia, which formed a mustard powdery-like deposit on the ilmenite and torbernite and autunite (uranium phosphates of copper and calcium respectively), both from Mount Painter, South Australia, and both much richer than carnotite. The former occurred as bright green scaly crystals and the latter in orange yellow.

In conclusion Dr. Flecker said that he could assure Dr. Dennis that the improvements which he noted with the very mild doses, were even more striking when the more moderate doses were given. Thus one frequently met with very rapid gain in weight, a stone or two for instance in several weeks, increased feeling of well being, increased sleep and appetite, improved colour, an increase in red cells from three to five million per cubic centimetre. In fact a general improvement in all the bodily functions was very often seen after moderate doses of irradiation.

DR. R. FOWLER considered that on the evidence obtained from all sources radium was a therapeutic agent of proven value in gynæcology for both malignant and non-malignant conditions. In many respects it was still in the experimental stage, but in many others indeed its usage was practically standardized. It was on account of the latter fact that he considered it expedient for gynæcologists to become proficient in radium therapy. Indeed he urged members of the Section to follow the example of many eminent gynæcologists and of dermatologists the world over who carried out their own radium therapy. Gynæcologists should not limit themselves to the use of the knife, but should apply to their speciality all known methods of therapeusis, whether they were medicinal,

physical or otherwise. All radiologists were not so generous as Dr. Macdonald had been that evening in admitting that the gynæcologist must be the final arbiter as to the indications and technique of treatment as well as in the assessment of results. This meant in other words that the radiologist should be the technical assistant of the practitioner responsible for the treatment of the patient.

DR. W. CUSCADEN said that he agreed with Dr. Fowler that the gynæcologist should direct the treatment. At the Middlesex Hospital Mr. Berkeley always inserted the radium himself. It had been stated that night that there was no such thing as stimulation by radium. It was said that a dose eighty would kill both body and cancer cells, a dose seventy would kill cancer, but not body cells, a dose of sixty would stimulate cancer growth. As radium varied in efficiency as the square of the distance, it followed that there must be a surrounding zone of stimulation and for this reason it was said that radium increased the incidence of secondary deposits. So strong was this belief that many, notably Mr. Bonney and the Wertheim Clinic, would not allow radium to be used on patients on whom they intended to operate. A panhysterectomy was fairly easy, the Wertheim technique practically impossible after the use of radium.

DR. R. H. MORRISON said that his opinion regarding radium or operation in cervical carcinoma had of late years swung definitely in favour of the former, except in very early cases. He disapproved of any preliminary treatment, such as curettage or cauterization if radium treatment were to be used. He had several patients alive and apparently cured who had been treated for cervical carcinoma—some of them definitely inoperable—by radium alone. He would still operate in very early cases and after three weeks send the patients for radium treatment. He had no doubt that in corporeal carcinoma hysterectomy gave better results than radium.

Pelvic inflammation was stated to be a contraindication to the use of radium, but in his experience no ill effects had occurred, nor had he seen it light up an old infection. In any acute inflammation it would of course be wise to delay the application.

DR. E. R. WHITE said that a number of these patients had passed through his hands and had been referred to Dr. Dennis as inoperable and in most instances as hopelessly inoperable The beneficial results obtained by radium were wonderful, even though they were temporary, large fungating masses disappeared and bleeding and offensive discharges stopped. In early cases operation with the subsequent use of radium gave the best chance of cure. Dr. White recalled a patient suffering from early epitheliomata of the *cervix uteri* who had refused operation; radium had been applied by Dr. Dennis over four years previously and the patient was quite well.

Dr. White was interested in the treatment by radium of menorrhagia in young women. There were no opportunities of observing this at the Women's Hospital, as the supply of radium was insufficient for the treatment of patients suffering from malignant disease. He referred to a patient treated outside the hospital, a young woman who had suffered from a miscarriage and a retained placenta. Later multiple myomata had been present and two of them were in the cervix; the patient had been a subsequent candidate for subtotal hysterectomy. However, two light applications of radium had been made with the result that remarkable shrinkage of the tumours occurred, conception took place soon afterwards and a normal child was born without difficulty at term.

DR. E. A. SPOWERS asked the opinion of the radiologists as to how soon radium should be applied after panhysterectomy for carcinomata when it was known that malignant tissue had been cut through and some had been left behind through inability to remove it. He had made a first application two weeks after operation and apparently with no bad results. He would also like some information as to the action of radium on the ovaries of young women.

DR. A. NORMAN MCARTHUR said that his experience was that radium was the greatest ally that the gynæcologists could have in malignant disease of the uterus. Used only in inoperable cases the results were dramatic. The bleeding would cease, the offensive discharge disappear, the ulcerated cervix would clear up and the periuterine thickening would rapidly diminish. The reaction of radium was belated, no result being seen for three to four weeks after insertion. These dramatic results of introduction of radium often rendered an inoperable tumour operable and in operating on these patients after treatment by radium he found panhysterectomy much easier, as the periuterine inflammatory matter had been changed into mucilaginous substance. This finding was quite contrary to that of British surgeons who said that the periuterine fibrosis was increased and the difficulties of panhysterectomy were much greater. Perhaps this was because in Australia they had less radium and very large doses were not used. He believed that radium doses should be such that tissues were not destroyed by sloughing. Several patients apparently cured by radium had suffered from recurrence spreading rapidly. Hence he preferred where possible, surgical removal of the uterus and the use of radium afterwards to prevent the likelihood of any recurrence. The less the cervix was handled surgically before the introduction of radium, the better the result would be. He, unlike Dr. Fowler, gave his patients for radium treatment into the hands of some expert who was constantly applying radium and who had had training in radium dosage and deep therapy. In uterine conditions he had found no benefit from deep therapy. The administration of shock doses of deep therapy produced only terror in the mind of the patient.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

Jackson, Henry Hollister, L.R.C.P. *et* S. (Edinburgh), L.F.P.S. (Glasgow), 1909, Melbourne.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Brown, Reginald Ernest, M.B., Ch.M., 1921 (Univ. Sydney), 64, Ocean Beach, Manly.
Claremont, Leslie Francis, M.B., Ch.M., 1924 (Univ. Sydney), 10, Phillip Street, Neutral Bay.
Firth, William Balfour, M.B., Ch.M., 1924 (Univ. Sydney), 20, Queen Street, Mosman.

THE undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Frewin, Oscar Westcott, M.B., B.S., 1926 (Univ. Adelaide), Adelaide.
Gray, Keith Douglas, M.B., B.S., 1926 (Univ. Adelaide), Adelaide.
Forgan, Sydney Bayly, M.B., B.S., 1926 (Univ. Adelaide), Adelaide.
Drever, Donald Edward, M.B., B.S., 1926 (Univ. Adelaide), Port Augusta.
Hughes, James Estcourt, M.B., B.S., 1926 (Univ. Adelaide), Adelaide.
Reeves, Rupert Kirk, M.B., B.S., 1926 (Univ. Adelaide), Adelaide.
Stockbridge, Ronald Keith, L.R.C.P. (London), M.R.C.S. (England), 1926, Port Broughton.

THE NEW SOUTH WALES PUBLIC MEDICAL OFFICERS' ASSOCIATION.

A MEETING attended by about seventy members of the New South Wales and Commonwealth Public Medical Services was held at B.M.A. Building, 30-34, Elizabeth

Street, Sydney, on September 22, 1926, for the purpose of the inauguration of the New South Wales Public Medical Officers' Association. It was explained that the movement was supported by Dr. Cooper Patten, of the Society of Medical Officers of Health of Great Britain.

Dr. A. A. Palmer was unanimously elected to the chair. A provisional committee was appointed to draw up the rules of the Association. The committee consisted of the following: Dr. A. A. Palmer, Dr. S. E. Morris, Dr. E. L. Morgan, Dr. Evan Jones, Dr. A. E. Machin, Dr. H. H. Willis and Dr. K. Smith.

A second meeting was held on December 15, 1926, when the rules were discussed and accepted.

The first annual general meeting was held on January 12, 1927. The following officers were elected for the ensuing year:

President: Dr. A. A. Palmer.
Honorary Secretary: Dr. F. Tooth.
Honorary Treasurer: Dr. E. L. Morgan.
Members of Committee: Dr. S. E. Morris, Dr. E. L. Morgan, Dr. J. Purdy, Dr. Evan Jones, Dr. H. H. Newland, Dr. A. E. Machin, Dr. A. W. McCloy, Dr. H. H. Willis, Dr. M. R. Finlayson.

The objects of the Association are:

1. To promote friendly relations between its members.
2. To facilitate cooperation in health activities in New South Wales.
3. To promote the efficiency, medical qualifications and professional prestige of its members.
4. To open up careers for its members, especially for those in "dead end" positions.
5. To improve the status of and obtain more adequate remuneration for its members.
6. To assist members terminating their services with public bodies to obtain suitable employment, if they so desire.

Membership of the Association is open to all whole-time salaried medical officers employed by statutory bodies in New South Wales.

The entrance fee is five shillings and is payable by each member on his enrolment. The annual subscription is one guinea, due and payable in advance on the first day of January of each year.

University Intelligence.

MACDONALD PRESENTATION FUND.

The following subscriptions to the Macdonald Presentation Fund have been received since last week.

	£	s.	d.
Dr. M. McIntyre Sinclair and Dr. James Sinclair	5	5	0
H. A. Waldron, Esquire	3	3	0
Dr. E. H. Molesworth	3	3	0
C. H. Barter, Esquire and Friends	2	7	0
Dr. Gordon Tait	2	2	0
Professor J. C. Windeyer	2	2	0
Dr. Colvin Storey	2	2	0
Dr. W. M. A. Fletcher	2	2	0
Dr. Mary Burfitt Williams	2	2	0
Dr. O. Latham and Staff of Mental Hospital Laboratory	2	0	0
Dr. Selina C. Puckey	1	1	6
Dr. Ether Parnell	1	1	6
F.E.A.	1	1	0
Dr. W. S. Brookes	1	1	0
Dr. John R. Broome	1	1	0
Dr. A. Munro Edwards	1	1	0
Dr. T. Farranridge	1	1	0
Dr. E. W. Ferguson	1	1	0
Dr. P. Fiaschi	1	1	0
Dr. T. W. Freeman	1	1	0
Dr. J. J. Gearin	1	1	0
Dr. J. Hoets	1	1	0
Dr. L. T. Jobbins	1	1	0
Dr. W. MacDonald	1	1	0
Mr. and Mrs. A. Magull	1	1	0
Dr. T. R. Pearce	1	1	0
Dr. M. Potiris	1	1	0
Dr. Bernard M. Riley	1	1	0
Dr. A. Mark Stanton	1	1	0
Dr. G. R. Stafford	1	1	0
Dr. R. J. Silverton	1	1	0
Dr. G. Tahmindjis	1	1	0
Dr. A. C. Thomas	1	1	0
Dr. Mary A. Bertram	0	10	6
J. Leslie, Esquire	0	10	6
W. L. Magill, Esquire	0	10	6
Dr. S. G. Whitfield	0	10	6
E. Collins, Esquire	0	10	0
W. Graham, Esquire	0	10	0
Miss E. M. Hindmarsh	0	10	0
Dr. E. Marshman	0	10	0
W. Penson, Esquire	0	10	0
W. Tinsley, Esquire	0	10	0
J. Woollett, Esquire	0	10	0
Sums under 10s.	1	4	6
Amount previously acknowledged	89	18	6
	£147	7	0

As the presentation will be made by Professor D. A. Welsh in the Pathology Department Lecture Theatre, Medical School, on Thursday, March 24, at 2 p.m., intending subscribers are requested to forward amounts as soon as possible.

Obituary.

HENRY RIDDELL STANLEY.

The news of the death of Dr. Henry Riddell Stanley which was published in the issue of February 26, 1927, came as a shock to his friends. Returning from a trip abroad, he contracted enteric fever and although on his arrival in Australia he was very ill, it was expected that he would recover.

Henry Riddell Stanley was fifty-two years of age at the time of his death. He was the son of the late Commander H. J. Stanley, R.N., and Mrs. Stanley, of Armadale, Victoria. His grandfather was the late John Carre Riddell, sometime member of the Legislative Assembly of Victoria and his grandmother was the eldest daughter of the late Sidney Stephen, a former Chief Justice of New Zealand. Henry Riddell Stanley kept up the family tradition for service to the community, for he carried out his departmental duties and served his patients with singleness of heart. After graduation at the Melbourne University Stanley studied ophthalmology at Moorfield's Eye Hospital. He was soon afterwards appointed oculist to the Victorian Railway Department and was known throughout the service for his sound judgement. His pursuits outside his professional work were music and photography. He played the piano well and had some gifts as a vocalist. He gained a considerable reputation for his colour photography. Dr. Leonard Mitchell has written of his personal qualities. The sympathy of the medical profession is extended to his widow who had not recovered from an illness at the time of his death.

Dr. Leonard Mitchell writes:

Riddell Stanley I knew over a period of fourteen years and for the whole of that time was associated with him in the examining of the vision, colour sense and hearing of the employees of the Victorian Railways. Together we evolved a routine and by constant checking against each other were able to keep the standard even and pick up each other's work at a moment's notice. This may seem the natural order of things, but Stanley's generosity and scrupulous fairness made such a state of things possible of continuance over a period of years.

To few was it given to be close friends with him, but those who were so fortunate, saw an adoring and devoted husband, a loyal and affectionate son, a very excellent operatic tenor singer, a photographic amateur whose colour photography stood with the best professional work, a wireless enthusiast of distinguished accomplishments and

a pioneer motor cyclist. To sum up Riddell Stanley was a born mechanical genius and to watch him at fine work—eye surgery or wireless manipulating, left no doubt as to the active brain directing those capable hands which moved with such uncanny dexterity. As a friend he was one who never let me down and one who held his tongue when there was nothing good to be said about any particular acquaintance. Many younger men who have worked with him, will long remember his quick decision and his energetic way of putting his case forward and all who knew him will remember an English gentleman.

MARC JOHNSTON SYMONS.

WE regret to announce the death of Dr. Marc Johnston Symons which occurred at Adelaide on February 26, 1927.

Special Correspondence.

LONDON LETTER.

BY OUR SPECIAL CORRESPONDENT.

The Fellowship of Medicine.

IT has often been said that London can be the loneliest city in the world to the man who arrives there with no knowledge of its vastness and the complicated tangle of its streets. That this saying is strictly true can be vouched for by those coming to London from other towns in England and how much more then is it true for those arriving from overseas? From this point of view one would advise all Australians entering London for the first time to consider it a duty of the first importance to register themselves at Australia House. There they will find a warm welcome extended to them and will be able to learn something of the ways and methods of the city. They will also be given helpful advice as to the best way of satisfying their needs and can obtain addresses of associations most likely to be of use to them. In the case of the medical men and women who come to England with the intention of combining business with pleasure, of seeing not only the sights of London, but also of visiting the hospitals and medical institutions, the Fellowship of Medicine and Post-Graduate Medical Association, at 1, Wimpole Street, W.1., is only too anxious to assist them. An arrangement has been made whereby the authorities at Australia House periodically forward to the Fellowship of Medicine a list of the Australian doctors visiting England and to each name on the list the Fellowship sends a short account of its activities and of the facilities offered in regard to post-graduate medical study. The managers of the overseas banks in London also cooperate and have kindly consented to hand to each medical client a small packet containing particulars of the post-gradute study obtainable.

It is much hoped that Australian doctors will make a point of calling on the Fellowship of Medicine where they will find a hearty welcome awaiting them and where no effort will be spared in assisting them to obtain opportunities for studying their particular branch of medicine or surgery. Mr. H. W. Carson is in charge of the Overseas Department and is at all times ready to advise on individual requirements.

The Fellowship of Medicine is the main organization in London for the provision of instruction in medicine for qualified practitioners. It has affiliated to it some fifty hospitals in London, containing six thousand beds and with out-patient departments attended by many thousands of patients. All branches of medicine, surgery and the specialties are dealt with and instruction is given by expert teachers. Besides its own sphere of activities the Fellowship collates details of lectures, demonstrations or courses open to post-graduates, but not necessarily connected with the Fellowship, that are held at the various colleges, institutions and hospitals in London. In addition, information can be given on the facilities offered in other parts of Great Britain and Ireland. In Edinburgh and Glasgow in particular systematic courses in medicine, surgery and all special departments during the summer months are organized and detailed programmes of these are issued regularly every year and can be obtained from the Fellowship. The University of Wales holds courses of study for post-graduate diplomas every year, that for the Diploma in Public Health from October to June and for the Tuberculous Diseases Diploma from January to July. Dublin is the chief centre of post-graduate work in Ireland; in this city there are some ten clinical hospitals open to post-graduates and instruction is given daily from October to June. There are also three lying-in hospitals—the Rotunda, the Coombe and Holles Street Hospitals, where clinical instruction is given daily. A diploma in gynæcology and obstetrics offered by the University of Dublin is open to candidates who take out the prescribed course of study at Trinity College and the Rotunda Hospital.

Though no diploma in gynæcology and obstetrics is obtainable in London, there are opportunities for studying these branches of medicine and post-graduate courses lasting for a week, a fortnight or a month can be taken at the two chief hospitals associated with obstetrics. In the case of the two longer periods the instruction given is of a strictly practical nature, the post-graduate living in the residential college attached to the hospital and taking charge of a certain number of patients.

In October, 1925, the Fellowship of Medicine published the first number of the *Post-Graduate Medical Journal*. This is a monthly magazine which sets forth the courses of study obtainable in London under the auspices of the Fellowship, publishes articles of medical interest, descriptions of ward rounds, correspondence on post-graduate matters, reviews of books and in the editorial notes deals with all matters of post-graduate interest.

Books of Interest to Doctors.

The following books, though dealing with or written by members of the medical profession, are not of purely scientific interest, but it is thought that they might appeal to some of the readers of THE MEDICAL JOURNAL OF AUSTRALIA; "Victorian Jottings from an Old Common Place Book" (Etchells and Macdonald); Reminiscences of Sir James Crichton-Brown, M.D.; "Dame Louisa Aldrich-Blake" (Hodder and Stoughton), by Lord Riddell, a biography of a women pioneer doctor; "Autobiography of Sir Felix Semon" (Jarrolds), Edited by H. C. Semon, M.D.; "The Beloved Physician: Sir James Mackenzie" (Murray), by R. McNair Wilson, M.B., Ch.B.; "The Surgeons' Log" (Chapman and Hall), by J. Johnston Abraham.

Correspondence.

QUININE TOLERANCE AND PREGNANCY.

SIR: In THE MEDICAL JOURNAL OF AUSTRALIA of February 12 of this year "K. St. V. W." writes asking for information regarding quinine tolerance in pregnancy. I have had little experience in this question as my tropical work has been concerned with other matters, but I have looked up the available records of recent years and I have been able to collect the following which may be of use to your correspondent.

Acton (1921) experimenting on guinea pigs, found that solutions of quinine 1 in 150,000 amplified the normal rhythm of uterine contractions, that solution 1 in 56,000 or stronger induced tonic contractions which involved both the longitudinal and circular muscle fibres, thus differing from normal labour, in which there is relaxation of the circular fibres about the cervix. He considers that quinine up to twenty grains a day is unlikely to cause premature labour unless the *os* is patulous or the membranes weak and that quinine in the above doses is less likely to induce labour than the high temperature associated with malaria is likely to cause death of the fœtus.

Rigollet (1921) reported a case of a woman, *ætatis* nineteen, in the third month of pregnancy with simple tertian malaria. She had vomiting, diarrhœa, strong uterine contractions, coma and a temperature up to 40·8° C. (105·4° F.). Oral quinine was rejected so she received intravenously a dose of 1·2 grammes on one day, 1·8

grammes on the next day, when the uterine contractions became very painful. On the third day 0·3 gramme was given intravenously, this was followed by a crisis with general improvement and lessening of uterine pains. Cure was then completed by oral quinine and the pregnancy was uninterrupted.

Vignes (1922) stated that quinine should be given in the same doses during pregnancy as at other times and he quotes Frederici who in 1902 published records of forty-nine malarial pregnancies all treated with quinine and all going to term, except two cases who had high temperatures.

Slartscheff (1923) finds that quinine in therapeutic doses has no action on the pregnant uterus or fœtus, that abortion occurring in women is caused by the high temperature due to malaria and not to the quinine taken, that quinine is the best prophylactic in preserving the pregnant state in malaria and that it very seldom acts as an embolic. He quotes the case of a *multipara, ætatis* forty-two, who took one hundred grammes of quinine in the fourth month of pregnancy without its interruption.

Welch (1924) records the case of one woman who took fifty grains of quinine in a single dose in error and of another woman who took a hundred grains on three successive days deliberately, she had a sharp hæmaturia; both cases went to term. He has notes of many abortions which he holds are attributable to malaria.

Arnell (1924) reports two cases of women at about eight months. The first was a mild case of malaria and delivery occurred four days after commencing treatment with quinine methyl salicylate in doses of five grains three times a day, the second case was severe and of ten days' duration with vomiting and epistaxis for three days, she received two intravenous injections of quinine bihydrochloride of twenty grains each in the space of four hours and two hours after the second injection she was delivered. The children in both cases were living.

Summarizing these records it seems safe to conclude that quinine in therapeutic doses has no effect in terminating pregnancy and has rather the opposite tendency by curing the malaria which is the real cause of abortion in these cases.

Yours, etc.,

PHILIP A. MAPLESTONE.

St. Helen's, Tasmania,
February 25, 1927..

References.[1]

Hugh W. Acton: "The Action of Quinine on the Pregnant Uterus," *The Lancet*, January 29, 1921, pages 216-218.

H. M. Arnell: "Administration of Quinine During Pregnancy" (Correspondence), *Kenya Medical Journal*, 1924, Volume I., page 189.

Rigollet: "*Menace d'avortement dans le cours d'un accès pernicieux. Guèrison par le traitement quinique*," *Bulletin de la Société de Pathologie Exotique*, 1921, Volume XIV., pages 535-537.

M. Slartscheff: "*Ueber Wirkung des Chinins auf die Gravidität und den Geburtsakt*," Summarized in *Archiv für Schiffs- und Tropen-Hygiene*, 1923, Volume XXVIII., pages 46-47.

H. Vignes: "*Paludisme et gestation*," *Journal des Praticiens*, 1922, Volume XXXVI., page 467-468.

H. V. Welch: "The Administration of Quinine During Pregnancy," *Kenya Medical Journal*, 1924, Volume I., pages 124-127.

SIR: May I contribute a few notes on the above matter in response to the suggestion of "K. St. V. W."

Firstly, one should always keep in mind the fact that a pregnant woman is much more tolerant of quinine than she is of malaria. Quinine may tend in considerable doses to produce miscarriage in women who abort easily, but it is a common experience that repeated malarial attacks will lead to the same result. Undoubtedly miscarriage is more likely to occur if malarial infection is not adequately treated. Secondly, in all the literature on the subject in recent years the prophylactic use of quinine still has its adherents and opponents; my own experiences place me amongst the former. But "grains xx. in one dose for occasional attacks of fever" is a most pernicious practice in the treatment of any case of malaria and especially of a pregnant woman with malaria. In no way does it influence the malarial infection and it may be a contributing factor in bringing about a miscarriage. Patients with these "occasional attacks of fever" who are dosed, or dose themselves irregularly with varying amounts of quinine, are generally those who cause the most trouble. My own practice as regards the treatment of a pregnant woman with malaria is: (i.) make certain that the patient has malaria, (ii.) once the diagnosis is established, administer quinine regularly for a full course, for example, thirty grains daily (or more if the nature of the infection warrants it) for a week or ten days, twenty grains a day for the ensuing month and ten grains a day for a further month.

Lastly, as regards the failure to induce labour at full term by quinine and castor oil, this is not an uncommon experience in obstetric practice and it probably had no relation in the instance quoted to the fact that the patient was a malarial subject.

Yours, etc.,

LAURENCE H. HUGHES.

211, Macquarie Street, Sydney,
February 28, 1927.

[1] This summary has been compiled from the summaries of the articles quoted in the *Tropical Diseases Bulletin*.

A MATTER OF GREEK.

SIR: I have read in your issue of March 5 Dr. Jeffrey's second letter, but still do not understand him. I do not understand why he harps on my neglect in translation of words I did not quote in the original. I do not understand why he calls "to cut out arrows' a point of view; it is nobody's point of view; it is the activity in which Machaon's worth consists. I do not understand the worth of evildoers; men capable of much evil, so far from being worth much, are worthless. I admit I took one line from the *Iliad* and awarded in one sense to Laennec praise which, some two thousand years earlier, Homer had awarded in another sense to Machaon. I admit the quotation illustrates rather than describes Laennec's excellence. I submit that such usage is justifiable and not uncommon. I do not understand how it can be "heartless."

Greek will not bear word for word translation into English. Thus *πάντα ῥεῖ* would become "all flows"; this is absurd and the translation must be made more freely as "all things change" or "all is flux" or "incessant change is the order of the universe" or "forms of matter are inconstant" or even "human institutions are unstable": each is permissible according to the subject under discussion.

Again Homer's hexameter:

ἰητρὸς γὰρ ἀνὴρ πολλῶν ἀντάξιος ἄλλων

word for word would become—

"Physician for man of many worth of others."

Permissible translations are "the physician is a man worth many others," "the physician is the worthiest of men," "the physician is the most estimable (or most worthy of honour or most honourable) of men."

I do not understand how this ignores "many" and "others"; they disappear in separate form to reappear implicitly in the superlative, whose justification they are. Please note that "worth many others" is already comparative, not merely positive.

I do not understand .... But I fear to worry you.

Yours, etc.,

GUY GRIFFITHS.

131, Macquarie Street, Sydney,
March 7, 1927.

Post-Graduate Work.

A COURSE IN TROPICAL MEDICINE AND TROPICAL HYGIENE.

ARRANGEMENTS are in hand by the Commonwealth Department of Health for initiating a course of training in tropical medicine and tropical hygiene for medical

graduates at the Australian Institute of Tropical Medicine, Townsville.

The course will commence on May 1, 1927, and will extend over the ensuing twelve weeks with an additional two weeks for examinations.

The subjects covered will include, *inter alia*, tropical medicine and hygiene, protozoology, helminthology, medical entomology, bacteriology, tropical pathology, immunity technique, tropical ophthalmology and demonstrations of various aspects of practical tropical sanitation. The theoretical part of the course will cover about 180 hours and the practical part 150 hours of actual teaching and demonstration.

The Australian Institute of Tropical Medicine is fully equipped with all facilities for the teaching of its special subjects and has available a large amount of tropical pathological material in addition to an extensive library.

Medical graduates attending the course will receive a certificate covering such attendance. Those sitting for an examination in theory and practice at the close of the course will receive a further certificate stating the standard attained.

A fee of ten guineas will be charged to cover costs of the course. Applicants will be required to provide their own microscopes, but all other scientific material will be furnished by the Institute.

Townsville is in regular communication by rail and steamer with the Australian capitals. Steamer fares (single) first saloon, are as follows:

Melbourne to Townsville ..	£17	7	6
Sydney to Townsville	13	2	6
Brisbane to Townsville	8	5	0

Railway fares, first class, are as follows:

Melbourne to Townsville ..	£12	9	0
Sydney to Townsville	10	1	0
Brisbane to Townsville	5	17	1

Hotel accommodation is available at Townsville at rates ranging from £2 2s. to £4 10s. Suitable boarding house accommodation or flats are difficult to obtain.

Intending applicants are requested to communicate with either the Acting Director, Division of Tropical Hygiene, Commonwealth Department of Health, Eagle Street, Brisbane, or the Acting Director, Australian Institute of Tropical Medicine, Townsville, North Queensland.

Medical Appointments.

Dr. Peter Lalor has been appointed Acting Medical Superintendent of the Hospital for the Insane, Sunbury, Victoria.

* * * *

Dr. Samuel Henry Phillips (B.M.A.) has been appointed Public Vaccinator at Dimboola, Victoria.

* * * *

Dr. William Arnold Graham (B.M.A.) has been appointed Public Vaccinator at Echuca, Victoria.

* * * *

Dr. S. J. Minogue (B.M.A.) has been appointed Senior Medical Officer, Department of Mental Hospitals, New South Wales.

* * * *

Dr. Alwyn Leslie Kinna (B.M.A.) has been appointed Senior Medical Officer, Department of Mental Hospitals, New South Wales.

* * * *

Dr. Frederick Tooth (B.M.A.) has been appointed a Medical Officer of the Office of the Director-General of Public Health, New South Wales.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xxii.

CITY OF MELBOURNE: Medical Officer of Health.

PRINCE OF WALES' HOSPITAL, RANDWICK, SYDNEY: Temporary Resident Medical Officer.

SYDNEY HOSPITAL: Clinical Assistant to the Ear, Nose and Throat Department.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

MAR. 21.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAR. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAR. 23.—Victorian Branch, B.M.A.: Council.
MAR. 25.—Queensland Branch, B.M.A.: Council.
MAR. 29.—New South Wales Branch, B.M.A.: Council (Quarterly).
MAR. 31.—New South Wales Branch, B.M.A.: Branch (Annual).
MAR. 31.—Queensland Branch, B.M.A.: Branch.
APRIL 1.—Queensland Branch, B.M.A.: Branch.
APRIL 5.—New South Wales Branch, B.M.A.: Council (Election of Officers and Standing Committees).
APRIL 5.—Tasmanian Branch, B.M.A.: Council.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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